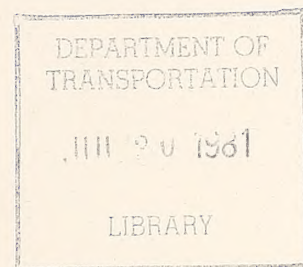


Report No. FHWA-RD-78-75

DEVELOPMENT OF A COST-EFFECTIVENESS MODEL FOR GUARDRAIL SELECTION

Vol. II. User's Manual



January 1980

Final Report

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**Prepared for
FEDERAL HIGHWAY ADMINISTRATION
Offices of Research & Development
Washington, D. C. 20590**

FOREWORD

This report is one of a set of reports documenting the development of a cost-effectiveness model for guardrail selection which includes cost parameters for various guardrail configurations as well as criteria for analysis of system effectiveness under various dynamic impact conditions.

Initially, two computer programs were developed for (1) determining the cost-effectiveness of a specific guardrail type and (2) comparative cost-effectiveness and rankings of eleven guardrail types. It is important to note that in the development and application of this model the guardrail was assumed to be warranted.


A speed distribution reported by Michigan in 1974 was used in the initial model development. Subsequently, another speed distribution developed by Calspan Corporation was used in the model.

The Calspan speed distribution was developed through the reconstruction of single vehicle accidents on two lane rural roads. The Michigan data was obtained from police reports on mostly freeway accidents. Because of differences in accident location and possibly also due to differences in data collection procedures, the Calspan speeds are generally lower than the Michigan speeds. For this reason the Calspan speed distribution data may be more appropriate for use on non-freeway sites while the Michigan speed distribution data may be more indicative of freeway conditions. The use of the lower speed distribution did, as expected, affect the guardrail rankings.

In order to provide flexibility, the speed distribution has been changed to a data input allowing the user to choose between the Michigan produced speed distribution, one developed by the Calspan Corporation or data developed directly by the user.

Two sets of site selection tables were also developed from the models for use in the field in making rough approximations of how the various guardrail types will rank. One set is based on the Michigan data; the other set is based on the Calspan data. In both cases, only the direct costs of the accidents were used. This was done to avoid the controversy surrounding the societal costs of accidents, the major portion of which is the loss of future earnings. This result has little effect on the relative rankings but does effect the site selection tables. The cost variable is also an input variable when using the models. Thus, the user may choose what he considers appropriate values for the costs of accidents.

Sufficient copies of the Executive Summary and the two volume report are being distributed to provide a minimum of one copy to each FHWA regional office and one copy to each FHWA division offices. Copies of the site selection tables based on the Calspan data will be made available to satisfy individual requests.


Charles F. Schaffey
Director, Office of Research
Federal Highway Administration

NOTICE

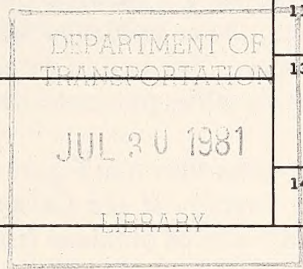
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16. Abstract <p>This research was conducted to develop a cost-effectiveness model for guardrail selection that includes cost parameters for eleven (11) guardrail configurations and criteria for analysis of system effectiveness under various dynamic impact conditions. Vehicle classes include 2250-lb (1021-kg) and 4500-lb (2041-kg) vehicles. Accident severities were based on extrapolations of full-scale test data and verified by means of guardrail accident reconstruction data. Two computer programs were developed: (1) the SSCOST program for cost-effectiveness values (state cost, societal cost, total cost, and benefit-to-cost ratio) of a single specified guardrail type with given roadway conditions, and (2) the COCOST program for comparative cost-effectiveness values and ranking of the eleven guardrail types with given roadway conditions. Program inputs are simple to prepare, and computer run times are minimal.</p> <p>This volume is a user's manual for applying the cost-effectiveness computer programs for (1) selection at a particular site of the most cost-effective guardrail system of the eleven included types, (2) guardrail placement at a site for the optimum location and guardrail type, and (3) priority ranking of several site selections for appropriation of available funds. Technical documentation supporting the computer algorithm is contained in Volume I.</p>					
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PREFACE

Since the completion of this report, a draft final report has been submitted for Contract No. DOT-FH-11-8501, "Methodology for Reducing the Hazardous Effects of Highway Features and Roadside Objects," by Calspan Field Services, Incorporated. This contract involved the collection and analysis of data for 7,972 accidents on both freeway and non-freeway types of roads.

The impact speed distribution obtained from this Calspan study differed significantly from that used in this report (see Figure 6, page 36 of Volume I). Also, a question was raised by FHWA concerning the occupant severity index (see Figure 9, page 51 of Volume I). Consequently, sensitivity analyses were conducted of the speed distribution and severity indices used in the cost-effectiveness model of this study. The conclusions of the analyses were that the model is sensitive (order of preference of guardrail types as well as corresponding values) to both changes in severity and the change in speed distribution.

Details of these sensitivity analyses are shown in the Addendum starting on page 48. Because of the sensitivity of these parameters, the computer programs discussed herein have been changed to include user specified input for speed distribution percentages and severity index factors. Further, sensitivity analyses and site selection tables presented herein have been rerun with the Calspan speed distribution.

If the Michigan speed distribution shown in Figure 6 of Volume I is representative, the user can apply the results of this report directly. If the Calspan distribution is more representative (see Addendum), the regenerated results can be obtained from FHWA for use. Finally, if other distributions or modifications of the severity indices (Figure 9 of Volume I) are desired, the user can specify the input values and conduct computer runs to prepare his own set of guardrail selection aids.

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METRIC CONVERSION FACTORS

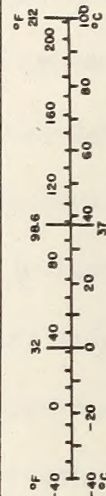
Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
in	inches	2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
AREA				
in ²	square inches	6.5	square centimeters	cm ²
ft ²	square feet	0.09	square meters	m ²
yd ²	square yards	0.8	square meters	m ²
mi ²	square miles	2.6	square kilometers	km ²
	acres	0.4	hectares	ha
MASS (weight)				
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
VOLUME				
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft ³	cubic feet	0.03	cubic meters	m ³
yd ³	cubic yards	0.76	cubic meters	m ³
TEMPERATURE (exact)				
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

*1 in = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price \$2.25, SO Catalog No. C13.10-286.

Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
km	kilometers	1.1	yards	yd
		0.6	miles	mi
AREA				
cm ²	square centimeters	0.16	square inches	in ²
m ²	square meters	1.2	square yards	yd ²
km ²	square kilometers	0.4	square miles	mi ²
ha	hectares (10,000 m ²)	2.5	acres	
MASS (weight)				
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
VOLUME				
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m ³	cubic meters	35	cubic feet	ft ³
m ³	cubic meters	1.3	cubic yards	yd ³
TEMPERATURE (exact)				
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



I. INTRODUCTION

With the problems of ever-increasing highway construction costs and the limited funding available, it has become of critical importance that a cost-effectiveness decision policy be formulated for selecting the various alternatives between guardrail types. This is particularly true for the rural, low-volume highway. With such roads, strict adherence to current guardrail warranting and installation procedures could lead to the installation of guardrails of maximum effectiveness at some sites and no installations at other sites because of the lack of available funds. Thus, the need exists for the development of effective criteria for the selection of guardrail types based on a cost-effectiveness analysis. The value of such a cost-effectiveness decision-making policy need not be limited to low-volume roads and could result in more efficient utilization of available funds for all types of highway systems.

The objective of this program was to develop a cost-effectiveness model for guardrail selection that includes cost parameters for various guardrail configurations as well as criteria for analysis of system effectiveness under various dynamic impact conditions. Two computer programs were developed: (1) the SSCOST program for cost-effectiveness values (state cost, societal cost, total cost, and benefit-to-cost ratio) of a single specified guardrail type with given roadway conditions, and (2) the COCOST program for comparative cost-effectiveness values and ranking of the eleven included guardrail types with given roadway conditions. For flexibility in use of the model, particularly with regard to regional costs, most of the required input parameters can be specified by the user. However, the input format is quite simple and does not require the use of experienced programmers.

The following definitions apply with regard to the cost-effectiveness values used in the study:

- (1) state cost — money spent by the state in installing and maintaining the guardrail.
- (2) societal cost — costs associated with accidents, including costs of injuries and fatalities, costs of guardrail and vehicle damage, and cost of traffic delay.
- (3) total cost — the sum of state and societal costs.
- (4) benefit — the difference between societal cost with no guardrail installation and societal cost with the guardrail installed. Hazard types include fixed objects or embankments.
- (5) benefit-to-cost ratio — the ratio of the benefit to the state cost. Thus, to effect a savings in societal costs greater than the state cost of the guardrail installation, a benefit-to-cost ratio greater than unity must be realized.

Volume I of this report contains technical documentation and describes the research efforts undertaken to collect and analyze the available data, quantify the pertinent parameters of the cost-effectiveness model, and develop the computer algorithm. This volume contains the computer program listings and instructions and examples for applying the programs for (1) selection at a particular site of the most cost-effective guardrail system of the eleven included types, (2) guardrail placement at a site for the optimum location and guardrail type, and (3) priority ranking of several site selections for appropriation of available funds. Representative costs are supplied for those engineers and administrators who might wish to use them, and tables are included for field use in site rankings of the eleven included guardrail types.

II. BASIS OF PROGRAM

The dashed-line portion of Figure 1 represents the cost-effectiveness analysis in the guardrail design process. Note that though the need for the guardrail exists, as determined by standard warranting procedures, the guardrail construction may not be warranted because it is not cost effective. Further, construction may be delayed even for cost-effective sites because of economic constraints. Results of the cost-effectiveness analysis can be used to establish priorities that will be helpful in selecting the most cost-effective installations with limited available funding.

The cost-effectiveness algorithm used in this study is based on present-worth state and societal costs for the installation of the eleven (11) guardrail types shown in Table 1. Comparison of the guardrail types for site selection or priority ranking can be made on the basis of (1) total societal costs, (2) total of state and societal costs, or (3) benefit/cost ratios. In order to accomplish this, it was necessary in the study to estimate the required inputs shown in Figure 1. These include the following:

- (1) traffic mix (fractions of total traffic by 2250-lb and 4500-lb vehicles)
- (2) number of encroachments
- (3) probabilities of out-of-control vehicles traversing the offset distance to the guardrail or obstacle

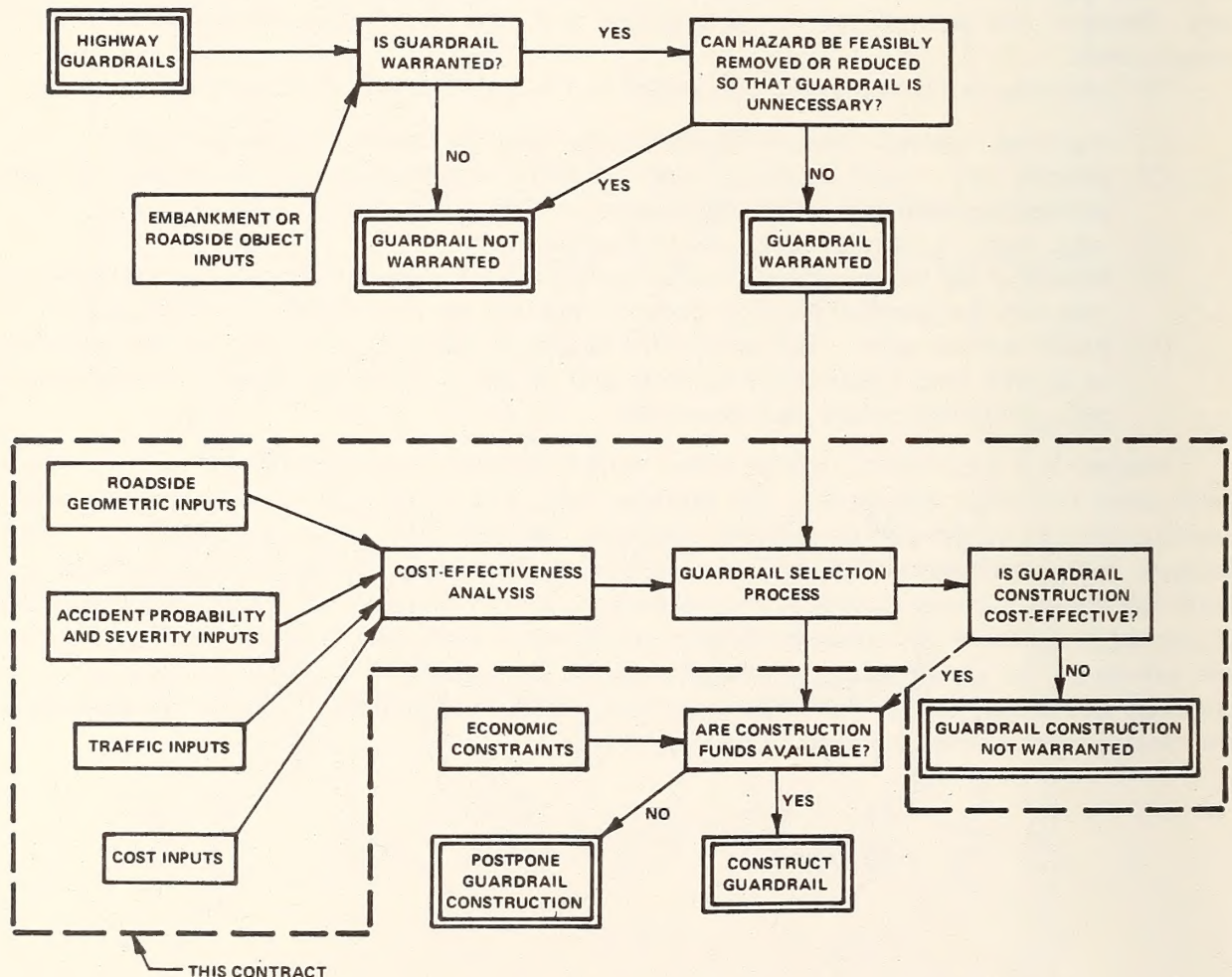


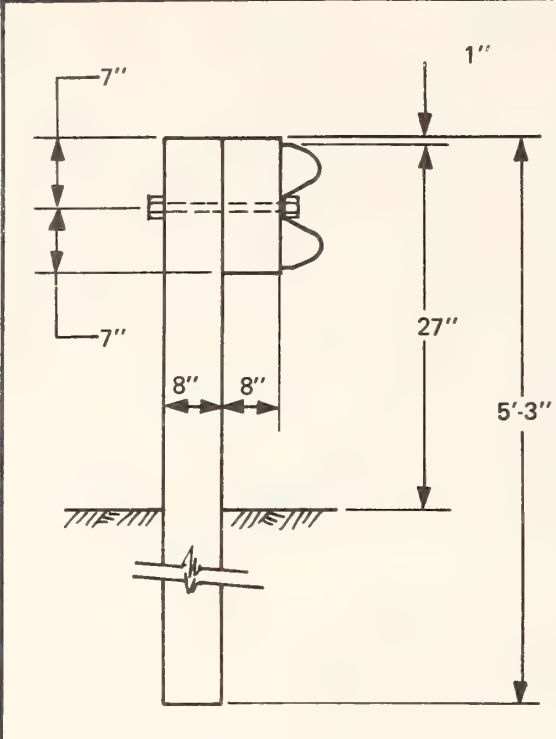
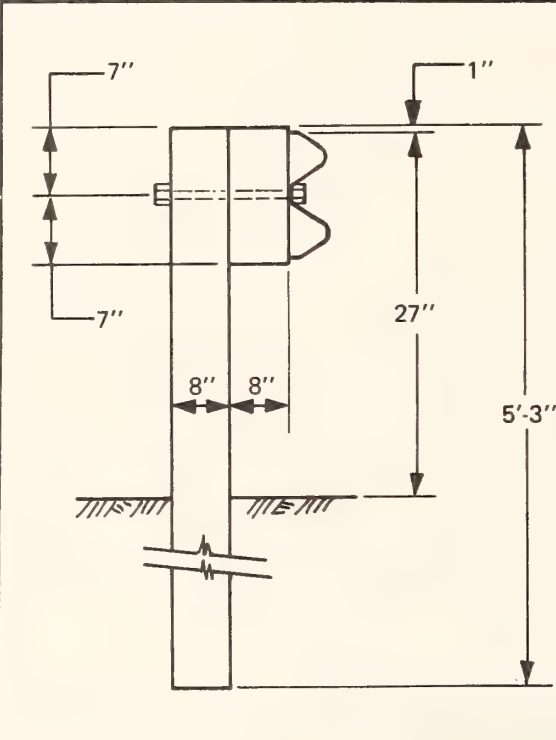
FIGURE 1. GUARDRAIL DESIGN PROCESS

TABLE 1. GUARDRAIL TYPES

	<p>DESIGN A</p> <p>Beam: 12 ga. W</p> <p>Post: 7-in. dia wood</p> <p>Post Spacing: 12 ft -6 in.</p> <p>Bolt: 1/4-in. dia (pipe insert in post)</p>
	<p>DESIGN B</p> <p>Beam: 12 ga. W</p> <p>Blockout: 8 X 8-in. wood</p> <p>Post: 8-in. dia wood</p> <p>Post Spacing: 6 ft -3 in.</p> <p>Bolt: 5/8-in. dia</p>

Metric conversion: Multiply ft by 0.305 to obtain m
Multiply in. by 0.0254 to obtain m

TABLE 1. GUARDRAIL TYPES (Cont'd)

Diagram	Beam	Blockout	Post	Post Spacing	Bolt
	12 ga. W	8 X 8-in. wood	8 X 8-in. wood	12 ft -6 in.	5/8-in. dia
	12 ga. W	6 X 8-in. wood	6 X 8-in. wood	6 ft -3 in.	5/8-in. dia

Metric conversion: Multiply ft by 0.305 to obtain m
Multiply in. by 0.0254 to obtain m

TABLE 1. GUARDRAIL TYPES (Cont'd)

	<p style="text-align: center;">DESIGN E</p> <p>Beam: 12 ga. W</p> <p>Blockout: Charley</p> <p>Post: Charley</p> <p>Post Spacing: 6 ft-3 in.</p> <p>Bolts: 5/8-in. dia</p>
	<p style="text-align: center;">DESIGN G1</p> <p>Beam: 3-3/4-in. cables</p> <p>Post: S3 X 5.7</p> <p>Post Spacing: 16 ft-0 in.</p> <p>Hook Bolts: 5/16-in. dia</p>

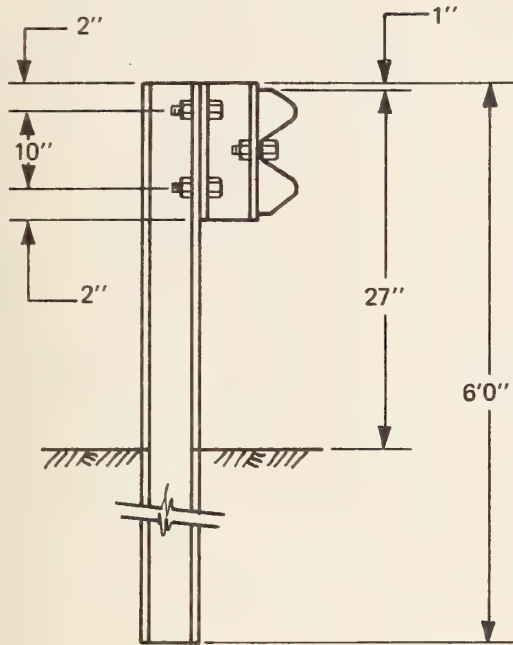
Metric conversion: Multiply ft by 0.305 to obtain m
Multiply in. by 0.0254 to obtain m

TABLE 1. GUARDRAIL TYPES (Cont'd)

	<p>DESIGN G2</p> <p>Beam: 12 ga. W</p> <p>Post: S3 X 5.7</p> <p>Post Spacing: 12 ft-6 in.</p> <p>Bolt: 5/16-in. dia</p>
	<p>DESIGN G3</p> <p>Beam: TS6 X 6 X 0.1875</p> <p>Post: S3 X 5.7</p> <p>Post Spacing: 6 ft-0 in.</p> <p>Bolt A: 3/8-in. dia</p> <p>Bolt B: 1/2-in. dia</p>

Metric conversion: Multiply ft by 0.305 to obtain m
Multiply in. by 0.0254 to obtain m

TABLE 1. GUARDRAIL TYPES (Cont'd)



DESIGN G4S

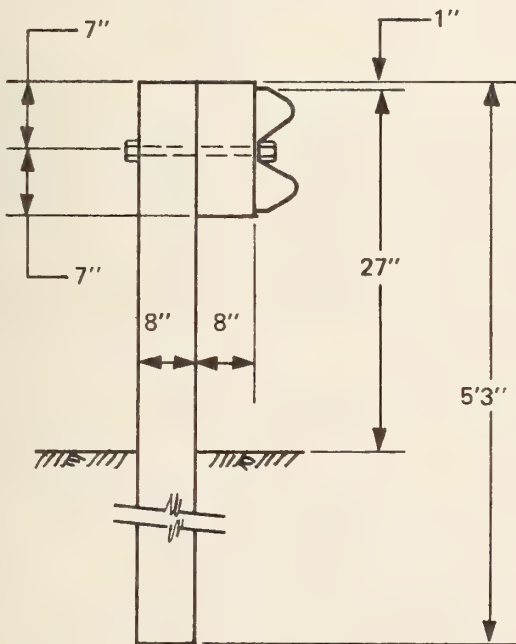
Beam: 12 ga. W

Blockout: W6 X 8.5

Post: W6 X 8.5

Post Spacing: 6 ft-3 in.

Bolts: 5/8-in. dia



DESIGN G4W

Beam: 12 ga. W

Blockout: 8 X 8-in. wood

Post: 8 X 8-in. wood

Post Spacing: 6 ft-3 in.

Bolt: 5/8-in. dia

Metric conversion: Multiply ft by 0.305 to obtain m
Multiply in. by 0.0254 to obtain m

TABLE 1. GUARDRAIL TYPES (Cont'd)

	<p style="text-align: center;">DESIGN THRIE</p> <p>Beam: 12 ga. Thrie</p> <p>Blockout: W6 X 8.5</p> <p>Post: W6 X 8.5</p> <p>Post Spacing: 6 ft-3 in.</p> <p>Bolts: 5/8-in. dia</p>
--	--

Metric conversion: Multiply ft by 0.305 to obtain m
Multiply in. by 0.0254 to obtain m

- (4) distribution of vehicle speeds
- (5) distribution of impact angles
- (6) accident severities in terms of guardrail damage, number of occupant injuries or fatalities, and vehicle damage for each combination of the category vehicle speeds and impact angles
- (7) travel delay time for accident blockage and guardrail repair
- (8) costs of injuries, fatalities, vehicle damage, travel delay, and guardrail installation, repair, maintenance, and salvage value
- (9) service life of the guardrail and rate of interest.

Details of how each of these items was quantified are discussed in Volume I, Technical Documentation.

III. LIMITATIONS OF PROGRAM

As with any cost-effectiveness program, certain limitations exist because of the complexities of the problem, the meager data that is available, and the assumptions that must be made to fill the gap areas. Thus, engineering judgment should be used along with the program in making the guardrail selections and appropriating funds. The following should be considered in the process:

- (1) Certain sites sometimes demonstrate an area of unusually high accident frequencies that may or may not be identified by the cost-effectiveness program. Such sites might have to be considered as high-priority spot improvement locations.
- (2) This program is concerned with guardrail selection at sites where guardrails are warranted. Situations are not included in which alternate means are employed to eliminate the warrant, such as flattening slopes or removing the obstacle. However, the program can be used to compare costs of installing guardrail with these other alternatives.
- (3) The BARRIER VII computer program was used to extrapolate full-scale vehicle crash test data and establish severities for the various combinations of vehicle speeds and impact angles. This program will not predict vehicle wheel snagging on the guardrail posts, which has been demonstrated in full-scale tests to produce severe results in stiff post systems without adequate blockouts or with the larger post spacing. For example, suppose a guardrail order of Designs C, A, and G2 is indicated by the program and the evaluation criterion used for the ranking (i.e., societal cost, total cost, or B/C ratio) does not differ significantly for the three systems. Both guardrail types A and C with their 12.5-ft (3.81-m) post spacing and strong posts have demonstrated the tendency for wheel snagging and vehicle pocketing. Though not supported by study of test data in this program, it is asserted in the 1977 AASHTO "Guide for Selecting, Locating, and Designing Traffic Barriers" that experience also appears to indicate that the longer post spacings may allow a rail to twist into a ramp and thus cause vaulting. Thus, excluding local considerations that might dictate the use of A or C, type G2 with its weak posts would be the choice to reduce these tendencies. This demonstrates the use of engineering judgment in conjunction with the program rankings in making the final guardrail selection.
- (4) In order to establish benefit/cost ratios, it was necessary to estimate average severity levels for a typical accident with no guardrail. Fixed object obstacles and embankments are included in the program. From very limited accident data,⁽¹⁾ it was assumed that a typical accident for embankments would result in average severities of 0.05 fatality, 0.50 injury, and 0.50 vehicle damage. Average severities assumed for fixed objects were 0.50 fatality, 0.50 injury, and 0.50 vehicle damage per accident. Further, severities of 0.50 fatality, 0.50 injury, and 0.50 vehicle damage were assumed when the dynamic deflection of the guardrail exceeded the guardrail-to-obstacle distance. The resulting evaluation values will not materially affect the rankings at the site where the program has been applied. However, in comparing the program B/C ratios with those of fix-up alternatives other than guardrails, inconsistencies might occur because of the manner in which these alternative benefits are derived.
- (5) In establishing severities, only one vehicle occupant was assumed so that occupant severities were set at 1.0 fatality and 0.0 injury or 0.0 fatality and 1.0 injury. If it is desired to expand from this occupant base to some known accident base, it can be done by modifying the input values of injury and fatality costs. For example, Council and Hunter⁽²⁾ found from North Carolina data that averages of 1.18 fatalities and 1.118 injuries occurred per fatal accident and 1.601 injuries per injury accident. Using base costs of \$84,400 for fatalities (with \$900 of property damage included) and \$5,350 for injuries,

they used $1.18 (84,400) + 1.118 (5350-900) = \$104,567$ and $1.601 (5350) = \$8,565$ for fatality and injury costs, respectively, in 1973 dollars. Volume I of this report shows that the relative priority ranking of guardrails is not significantly affected by wide ranges of fatality and injury costs. However, the actual societal cost, total cost, and benefit/cost values will change considerably.

- (6) Only two vehicle classes are included in the program: 2250-lb vehicles to represent the smaller automobiles and 4500-lb vehicles to represent the larger automobiles and light trucks. If known, the vehicle mix can be specified in the input data.
- (7) A worksheet approach was attempted for field calculations to determine site guardrail priorities. However, with the large number of variables involved, the accompanying set of severity and travel delay tables would be too voluminous. The set of tables for site selection in Appendix A involves the specification of values and costs for a number of the variables that may not be applicable for a particular site. Consequently, these tables are limited to rough approximations of how the various guardrail types will rank. For more accurate analysis, and for setting priorities in appropriation of funds, the simple field data should be recorded and sent into the state office for computer analysis. Both CDC and IBM versions of the program have been prepared so that the program can be made operational on the various state computers with a minimum of effort.

IV. GUARDRAIL WARRANTS AND LENGTH OF NEED

It is assumed in this program that guardrails are warranted at the various sites of interest. References 3, 4, and 5 contain warranting procedures. References 4 and 5 also contain methods for determining the guardrail length of need. However, these methods produce lengths that might be considered conservative in view of the current economic constraints, particularly for the low volume rural road. For example, for the condition shown in Figure 2, the Reference 4 method produces a value for the end of guardrail need of

$$X_U = \left(1 - \frac{4}{10}\right)(400) = 240 \text{ ft}$$

With a 50-mph speed and 5000 ADT, the method of Reference 5 yields

$$X_U = \left(1 - \frac{4}{10}\right)(290) = 174 \text{ ft}$$

A method that would produce what might be considered to be an absolute minimum guardrail length of need is illustrated in Figure 3. Assume the vehicle is a standard 4500-lb automobile traveling at 70 mph with a coefficient of tire-to-pavement friction of 0.50. Then the radius of turn of the vehicle can be used to determine the offset distance X by simple geometric principles. Details of the analysis are shown in Volume I of this report. Table 2 shows the resulting values of X for various values of D and $D+W$. For example, for the upstream end of the obstacle in Figure 2, $D = 6 + 4 = 10$ ft and $D+W = 6 + 4 + 3 + 3 = 16$ ft. From Table 2, the corresponding X -value

$$X_U = 71 \text{ ft}$$

is read directly. For the downstream end, $D = 6 + 12 + 4 = 22$ ft and $D+W = 6 + 12 + 4 + 3 + 3 = 28$ ft, which, from Table 2, gives

$$X_D = 40 \text{ ft.}$$

Assuming the actual length of the obstacle is $L = 100$ ft, the length of guardrail need, as shown in Figure 3, becomes

$$X_U + L + X_D = 71 + 100 + 40 = 211 \text{ ft}$$

It is recommended that a minimum guardrail length of 150 ft be used for all cases. Note in Figure 2 that an adequate anchor and crashworthy terminal should also be placed beyond both ends of the guardrail need.

Table 2 can also be used to determine the exposure length of the obstacle, a required input for the COCOST computer program. Again, for Figure 2, the upstream values of $D = 6 + 4 + 3 = 13$ ft and $D+W = 6 + 4 + 3 + 3 = 16$ ft give

$$X_U = 48 \text{ ft}$$

from Table 2. Downstream values of $D = 25$ ft and $D+W = 28$ ft produce

$$X_D = 30 \text{ ft}$$

Then the obstacle exposure length becomes

$$X_U + L + X_D = 48 + 100 + 30 = 178 \text{ ft}$$

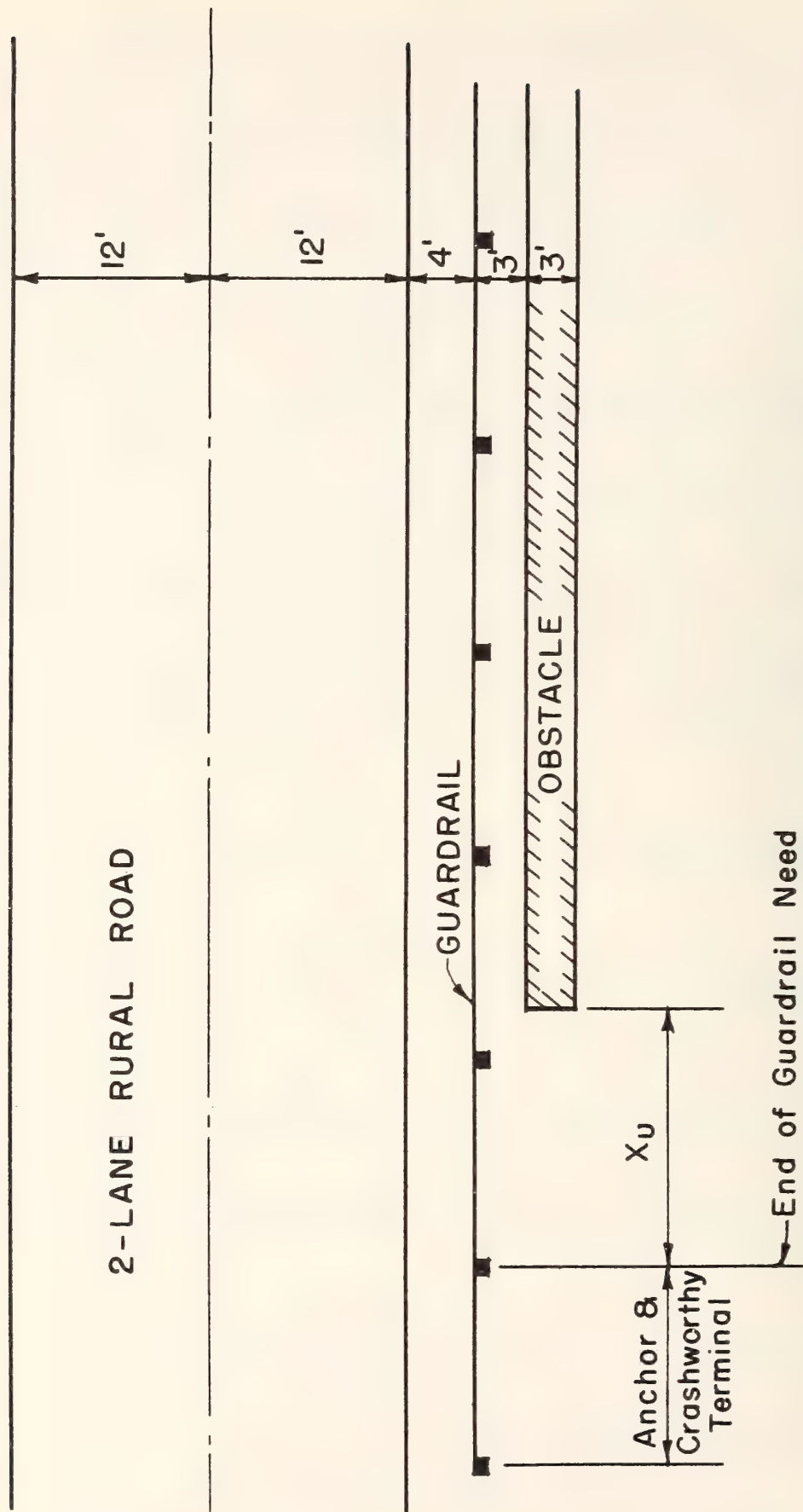


FIGURE 2. UPSTREAM GUARDRAIL LENGTH OF NEED

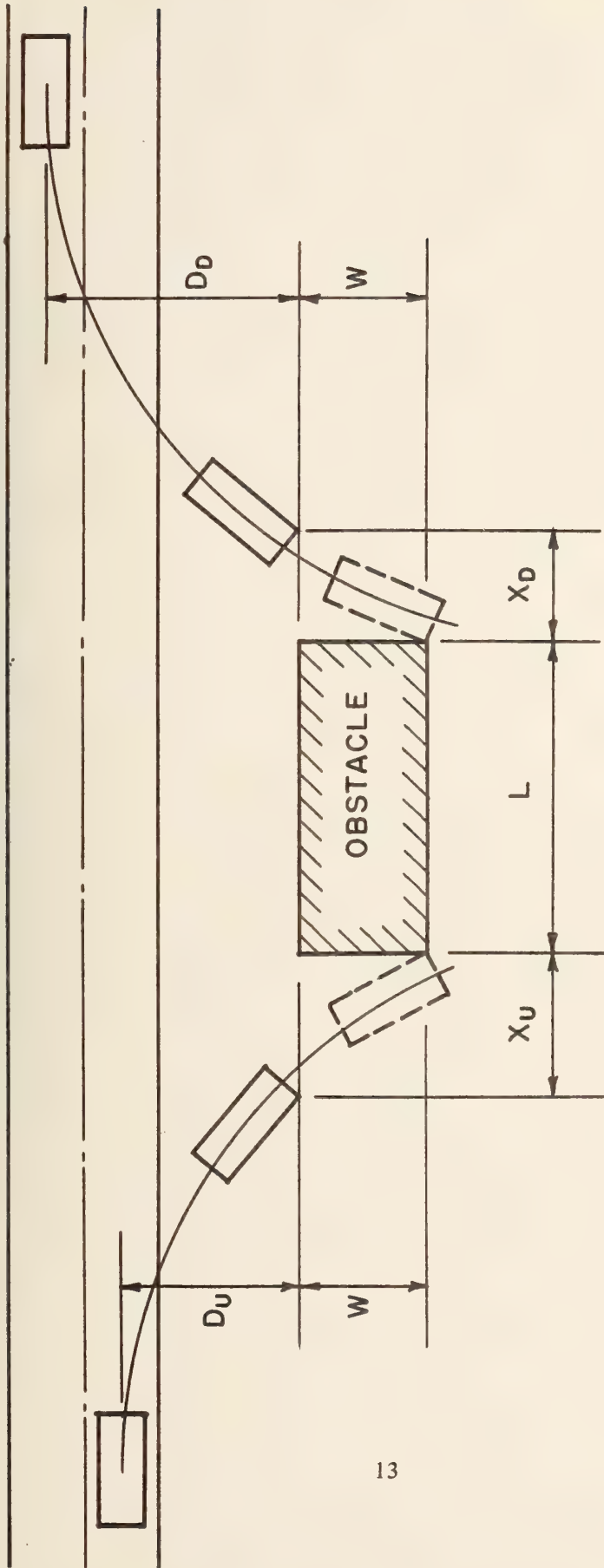


FIGURE 3. DETERMINATION OF EXPOSURE LENGTH

TABLE 2. GUARDRAIL POINT OF NEED VALUES

Values of D + W	Values of D											
	9	10	11	12	13	14	15	16	17	18	19	20
9	48	0	0	0	0	0	0	0	0	0	0	0
10	54	45	0	0	0	0	0	0	0	0	0	0
11	59	50	42	0	0	0	0	0	0	0	0	0
12	63	55	46	39	0	0	0	0	0	0	0	0
13	68	59	51	43	36	0	0	0	0	0	0	0
14	72	63	55	48	41	34	0	0	0	0	0	0
15	76	67	59	52	45	38	32	0	0	0	0	0
16	80	71	63	55	48	42	36	30	0	0	0	0
17	83	75	66	59	52	46	40	34	29	0	0	0
18	87	78	70	62	55	49	43	37	32	27	0	0
19	90	81	73	66	59	52	46	41	35	31	26	0
20	93	84	76	69	62	55	49	44	39	34	29	25
21	96	88	79	72	65	59	53	47	42	37	32	28
22	99	91	82	75	68	62	56	50	45	40	35	31
23	102	94	85	78	71	65	59	53	48	43	38	34
24	105	96	88	81	74	67	61	56	51	46	41	37
25	108	99	91	84	77	70	64	59	53	49	44	40
26	111	102	94	87	80	73	67	62	56	51	47	42
27	114	105	97	89	82	76	70	64	59	54	50	45
28	116	108	100	92	85	79	73	67	62	57	52	48
29	119	111	102	95	88	82	75	70	65	60	55	51
30	122	113	105	98	91	84	78	73	67	63	58	54
31	125	116	108	101	94	87	81	75	70	65	61	56
32	128	119	111	103	96	90	84	78	73	68	64	59
33	130	122	114	106	99	93	87	81	76	71	66	62
34	133	125	116	109	102	95	89	84	79	74	69	65
35	136	127	119	112	105	98	92	87	81	77	72	68
36	139	130	122	115	108	101	95	90	84	79	75	71
37	142	133	125	117	110	104	98	92	87	82	78	73
38	145	136	128	120	113	107	101	95	90	85	81	76
39	147	139	131	123	116	110	104	98	93	88	83	79
40	150	142	133	126	119	113	107	101	96	91	86	82
41	153	144	136	129	122	115	109	104	99	94	89	85
42	156	147	139	132	125	118	112	107	101	97	92	88
43	159	150	142	135	128	121	115	109	104	99	95	90
44	162	153	145	137	130	124	118	112	107	102	98	93
45	165	156	148	140	133	127	121	115	110	105	100	96
46	167	159	151	143	136	130	124	118	113	108	103	99
47	170	161	153	146	139	132	126	121	116	111	106	102
48	173	164	156	149	142	135	129	124	118	113	109	105
49	176	167	159	151	144	138	132	126	121	116	112	107
50	178	170	161	154	147	141	135	129	124	119	114	110
51	181	172	164	157	150	143	137	132	126	121	117	113
52	184	175	167	159	152	146	140	134	129	124	120	115
53	186	177	169	162	155	148	142	137	132	127	122	118
54	189	180	172	164	157	151	145	139	134	129	125	120
55	191	182	174	167	160	153	147	142	137	132	127	123
56	193	185	177	169	162	156	150	144	139	134	129	125
57	196	187	179	171	165	158	152	146	141	136	132	127
58	198	189	181	174	167	160	154	149	143	139	134	130
59	200	192	183	176	169	163	157	151	146	141	136	132
60	202	194	186	178	171	165	159	153	148	143	138	134

TABLE 2. GUARDRAIL POINT OF NEED VALUES (Cont'd)

Values of D + W	Values of D											
	21	22	23	24	25	26	27	28	29	30	31	32
21	24	0	0	0	0	0	0	0	0	0	0	0
22	27	23	0	0	0	0	0	0	0	0	0	0
23	30	26	22	0	0	0	0	0	0	0	0	0
24	33	29	25	22	0	0	0	0	0	0	0	0
25	36	32	28	25	21	0	0	0	0	0	0	0
26	38	35	31	27	24	21	0	0	0	0	0	0
27	41	37	34	30	27	24	20	0	0	0	0	0
28	44	40	37	33	30	26	23	20	0	0	0	0
29	47	43	39	36	32	29	26	23	20	0	0	0
30	50	46	42	39	35	32	29	26	23	20	0	0
31	52	49	45	41	38	35	32	29	26	23	20	0
32	55	51	48	44	41	38	34	31	28	25	23	20
33	58	54	50	47	44	40	37	34	31	28	25	23
34	61	57	53	50	46	43	40	37	34	31	28	25
35	64	60	56	53	49	46	43	40	37	34	31	28
36	66	63	59	55	52	49	46	43	40	37	34	31
37	69	65	62	58	55	52	48	45	42	40	37	34
38	72	68	65	61	58	54	51	48	45	42	40	37
39	75	71	67	64	61	57	54	51	48	45	42	40
40	78	74	70	67	63	60	57	54	51	48	45	42
41	81	77	73	70	66	63	60	57	54	51	48	45
42	84	80	76	73	69	66	63	60	57	54	51	48
43	86	83	79	75	72	69	66	63	60	57	54	51
44	89	85	82	78	75	72	68	65	62	60	57	54
45	92	88	85	81	78	74	71	68	65	62	59	57
46	95	91	87	84	80	77	74	71	68	65	62	59
47	98	94	90	87	83	80	77	74	71	68	65	62
48	100	97	93	89	86	83	80	77	74	71	68	65
49	103	99	96	92	89	86	82	79	76	73	71	68
50	106	102	98	95	91	88	85	82	79	76	73	70
51	109	105	101	97	94	91	88	85	82	79	76	73
52	111	107	104	100	97	93	90	87	84	81	79	76
53	114	110	106	103	99	96	93	90	87	84	81	78
54	116	112	109	105	102	99	95	92	89	86	84	81
55	119	115	111	108	104	101	98	95	92	89	86	83
56	121	117	114	110	107	103	100	97	94	91	88	86
57	123	120	116	112	109	106	103	100	97	94	91	88
58	126	122	118	115	111	108	105	102	99	96	93	90
59	128	124	120	117	113	110	107	104	101	98	95	92
60	130	126	122	119	116	112	109	106	103	100	97	94
61	132	128	124	121	118	114	111	108	105	102	99	97
62	134	130	126	123	120	116	113	110	107	104	101	99
63	136	132	128	125	122	118	115	112	109	106	103	100
64	138	134	130	127	123	120	117	114	111	108	105	102
65	140	136	132	128	125	122	119	116	113	110	107	104
66	141	137	134	130	127	124	120	117	114	111	109	106
67	143	139	135	132	128	125	122	119	116	113	110	107
68	144	141	137	133	130	127	124	121	118	115	112	109
69	146	142	138	135	132	128	125	122	119	116	113	111
70	147	144	140	136	133	130	127	124	121	118	115	112

TABLE 2. GUARDRAIL POINT OF NEED VALUES

Values of D + W	Values of D											
	33	34	35	36	37	38	39	40	41	42	43	44
33	20	0	0	0	0	0	0	0	0	0	0	0
34	23	20	0	0	0	0	0	0	0	0	0	0
35	25	23	20	0	0	0	0	0	0	0	0	0
36	28	25	23	20	0	0	0	0	0	0	0	0
37	31	28	25	23	20	0	0	0	0	0	0	0
38	34	31	28	25	23	20	0	0	0	0	0	0
39	37	34	31	28	26	23	20	0	0	0	0	0
40	40	37	34	31	28	26	23	20	0	0	0	0
41	42	40	37	34	31	28	26	23	20	0	0	0
42	45	42	40	37	34	31	29	26	23	20	0	0
43	48	45	43	40	37	34	31	29	26	23	20	0
44	51	48	45	43	40	37	34	31	29	26	23	20
45	54	51	48	45	43	40	37	34	31	29	26	23
46	57	54	51	48	45	43	40	37	34	31	29	26
47	59	57	54	51	48	45	43	40	37	34	31	29
48	62	59	57	54	51	48	45	43	40	37	34	31
49	65	62	59	57	54	51	48	45	43	40	37	34
50	68	65	62	59	56	54	51	48	45	42	40	37
51	70	67	65	62	59	56	53	51	48	45	42	39
52	73	70	67	64	62	59	56	53	50	48	45	42
53	75	73	70	67	64	61	59	56	53	50	47	45
54	78	75	72	70	67	64	61	58	56	53	50	47
55	80	78	75	72	69	66	64	61	58	55	52	49
56	83	80	77	74	72	69	66	63	60	58	55	52
57	85	82	79	77	74	71	68	66	63	60	57	54
58	87	85	82	79	76	73	71	68	65	62	59	56
59	90	87	84	81	78	76	73	70	67	64	62	59
60	92	89	86	83	81	78	75	72	69	66	64	61
61	94	91	88	85	83	80	77	74	71	69	66	63
62	96	93	90	87	85	82	79	76	73	71	68	65
63	98	95	92	89	86	84	81	78	75	72	70	67
64	99	97	94	91	88	86	83	80	77	74	71	69
65	101	98	96	93	90	87	84	82	79	76	73	70
66	103	100	97	95	92	89	86	83	81	78	75	72
67	105	102	99	96	93	91	88	85	82	79	77	74
68	106	103	101	98	95	92	89	87	84	81	78	75
69	108	105	102	99	97	94	91	88	85	83	80	77
70	109	106	104	101	98	95	92	90	87	84	81	78
71	111	108	105	102	99	97	94	91	88	85	83	80
72	112	109	106	104	101	98	95	93	90	87	84	81
73	113	111	108	105	102	99	97	94	91	88	85	83
74	115	112	109	106	104	101	98	95	92	90	87	84
75	116	113	111	108	105	102	99	97	94	91	88	85
76	118	115	112	109	106	104	101	98	95	92	90	87
77	119	116	113	111	108	105	102	99	97	94	91	88
78	120	118	115	112	109	106	104	101	98	95	92	89
79	122	119	116	113	111	108	105	102	99	97	94	91
80	123	121	118	115	112	109	107	104	101	98	95	93

Note that this method gives significantly shorter guardrail lengths of need than the methods of References 4 and 5. Hence, some discretion might be warranted in its use. If the terminal is satisfactory for near head-on impacts, such as the breakaway cable terminal, the longer runout lengths of References 4 and 5 could be overly conservative. Flaring the guardrail ends could also be helpful in this regard (see Reference 5). Of course, the shorter lengths will have the advantage of fewer hits and, because of the construction cost savings, could conceivably result in more installations than would be afforded with the longer lengths. However, use of the method should probably be restricted to low volume rural roads.

V. REPRESENTATIVE COSTS AND INPUT VALUES

The cost-effectiveness model was developed with a view of providing flexibility in the specification of input data so that a particular highway agency can insert its own values for costs and other parameters. Discussed in this section are representative or typical mid-1975 values that have been used in the sample problems and that can be used by an agency if local data is not readily available.

Traffic Mix

It is necessary to specify the fraction of compact (2250-lb) and standard (4500-lb) automobiles for the traffic mix. Questionnaires sent to the states resulted in the following average values:

Fraction of 2250-lb vehicles = 0.25

Fraction of 4500-lb vehicles = 0.75

Guardrail Costs

Table 3 shows average guardrail installation costs by FHWA region. States were contacted, and responses were usually in the form of bid summaries that indicated considerable fluctuations because of the various lengths and other factors involved. To obtain better data for comparison purposes, a number of guardrail erectors were contacted for unit prices of a common length of installation. Except for significantly different values, which were excluded, Table 3 values are averages of all responses. The following average Region 6 values were used in the sample problems:

Type A	\$ 4.50/L.F.
B	6.00
C	5.00
D	6.25
E	6.10
G1	3.10
G2	4.35
G3	13.50
G4S	6.50
G4W	6.50
Thrie	7.50

TABLE 3. AVERAGE GUARDRAIL INSTALLATION COSTS (\$/L.F.)

FHWA Region	Guardrail Type				
	A	B	C	D	E
1	4.00	5.25	4.15	5.90	6.10
2	NA	NA	NA	5.30	6.90
3	3.75	5.20	4.00	5.00	6.30
4	NA	NA	6.65	NA	7.70
5	4.10	6.40	4.50	6.60	6.60
6	4.50	6.00	5.00	6.25	6.10
7	3.90	5.35	4.20	5.60	5.80
8	6.00	7.40	5.95	6.50	8.40
9	NA	6.30	5.60	7.75	NA

FHWA Region	Guardrail Type					
	G1	G2	G3	G4S	G4W	Thrie
1	3.10	5.40	14.10	6.30	NA	7.50
2	5.75	6.10	NA	6.60	5.50	NA
3	NA	3.75	NA	6.00	6.00	NA
4	NA	NA	NA	7.90	NA	NA
5	5.00	4.80	13.70	6.75	6.70	NA
6	3.10	4.35	13.50	6.50	6.50	7.50
7	2.75	3.80	12.80	6.40	5.70	NA
8	4.35	4.85	10.50	8.00	7.60	NA
9	5.00	NA	16.50	7.50	7.60	10.50

NA = Not Available

The variation of guardrail repair costs received from the states was even greater, ranging from 30 to 130 percent of the corresponding installation costs. For illustrative purposes, the cost of repair was set equal to the cost of installation.

With galvanized metal and treated wood, normal guardrail maintenance was considered negligible by the states. Thus, the yearly maintenance cost was set at zero in the sample problems. A salvage value of \$1.00 per foot was also used for each of the guardrail types.

Travel Delay

The following average values were used in the sample problems for travel delay factors:

Time to remove damaged vehicle	1.0 hour
Time to repair damaged guardrail	10.0 hours
Traffic delay cost	\$10/vehicle hour

Injury, Fatality, and Vehicle Costs

A direct cost approach was used for estimating injury and fatality costs (i.e., future productivity, property damage, and funeral costs were excluded). The following mid-1975 values were used:

Cost of injury	\$3,500 each
Cost of fatality	\$33,100 each

As indicated in Section III above, the occupant base used in the program can be changed to an accident base by modifying these costs.

The following average 1975 sticker prices were used for vehicle costs:

Cost of 2250-lb vehicle	\$3,200 each
Cost of 4500-lb vehicle	\$5,300 each

Economic Factors

To determine present worth state and societal costs, the following were used in the sample problems:

Guardrail service life	15 years
Current rate of interest	8 percent

VI. SAMPLE PROBLEMS

The input values shown in Section V above were used in several sample problems to illustrate the use of the cost-effectiveness model. This section discusses these uses.

Site Selection

The tables shown in Appendix A were developed for field use in site rankings of the guardrail types. For indexing purposes, the tables are numbered by (road type)-(pavement-to-guardrail distance)-(guardrail-to-obstacle distance). For example,

2R-5-4 = 2-lane rural road with 5 feet from pavement edge to guardrail and 4 feet from guardrail to obstacle

Road types in the tables include:

2R = 2-lane rural road

4R = 4-lane rural road (undivided)

D = all divided highways.

Note that the degree of curve is shown in the first column. Plus degrees indicate curvature to the left, and minus degrees indicate curvature to the right. A guardrail-to-obstacle distance of zero indicates an embankment type of hazard. Non-zero values indicate fixed object hazards. The tables can be used in the following ways:

- (1) For “quick and dirty” selections, the rankings shown can be used directly. Note that the selections can be made on the basis of state cost, societal cost, total cost, or benefit-to-cost ratio. The rankings are in the order of decreasing preference (the best is number 1 and the worst is number 11). The state cost criterion ranks the guardrails in the order of increasing state costs and hence indicates which system would be the cheapest to install. The societal cost criterion indicates the effectiveness of the guardrails in terms of increasing societal costs. However, neither of these criteria necessarily will show the most cost-effective system. Thus, cost-effective criteria of increasing total costs (state plus societal costs) and decreasing benefit-to-cost ratios are also included.

As an example, consider a 2-lane rural road turning to the left with a 4-degree curve. The guardrail is 6 feet from the edge of the pavement, and the obstacle is 4 feet back of the guardrail. From Table 2R-6-4 with +4 degrees of curve, the G2 guardrail is the most cost-effective system for either total cost or benefit-to-cost ratio. Suppose this system is not used in a particular state and it is desirable to select from types D, E, G4S, and G4W. The logical choice would be type D, which, though it ranks behind E in state cost, is better than all of the other three systems for societal cost, total cost, and benefit/cost ratio.

- (2) It must be realized that the selection criteria used above were based on the representative input values shown in Section V. If other values are used, the rankings will probably not be the same. However, costs associated with a guardrail installation are essentially linear with regard to AADT and exposure length. Thus, the values in the tables of Appendix A can be used to roughly determine values for certain other conditions. For example, consider Case 1 of Appendix C, with AADT = 5000, guardrail length = 500 ft, obstacle length = 400 ft, and curvature = 0 degrees. The values in this case could be approximated from Table 2R-3-2 (0° curve) as follows:

Societal cost with no guardrail:

$$\frac{\$710.68}{(\text{Table 2R-3-2})} \times \frac{4}{(\text{ratio of obstacle lengths})} \times \frac{5}{(\text{ratio of AADT's})} = \$14,214$$

State cost (for, say, guardrail type G4S):

$$\frac{\$618.48}{(\text{Table 2R-3-2})} \times \frac{5}{(\text{ratio of guardrail lengths})} = \$3,092$$

Societal cost (guardrail type G4S):

$$\frac{\$271.05}{(\text{Table 2R-3-2})} \times \frac{5}{(\text{ratio of guardrail lengths})} \times \frac{5}{(\text{ratio of AADT's})} = \$6,776$$

Total cost (guardrail type G4S):

$$\$3,092 + \$6,776 = \$9,868$$

Benefit-to-cost ratio:

$$(14,214 - 6,776)/3092 = 2.41$$

Note that the state cost could be estimated directly. For example, if the engineer knows that a G4S system (500 ft required) will cost \$5.00 per ft, end anchors (2 required) will cost \$200 each, and terminal sections (2 required) will cost \$400 each, the state cost is

$$500(5.00) + 200(2) + 400(2) = \$3,700.$$

In this sample problem, identical injury, fatality, and vehicle costs have been used for Table 2R-3-2 and Case 1 societal values. Such simple ratio manipulations of the Appendix A tables cannot be done for cases with different injury, fatality, and vehicle costs. Thus, the method is rather limited, and state computer runs for such cases are suggested.

Guardrail Placement

Consider the roadside condition shown in Figure 4. The COCOST program can be used to determine the optimum shoulder distance S to place the guardrail and the most cost-effective system to install. The first step involves setting the guardrail at various distances from the edge of the pavement. These are shown as shoulders in Table 4. Values of D and $D+W$ (see Figure 3) can then be established and the exposure lengths determined from Table 2. The results are shown in Table 4, from which it can be seen that the obstacle exposure length = 200 ft, and the guardrail lengths of need range from 311 ft to 222 ft for the various shoulder widths. Now assume that the AADT for the road is 5000. The next step is to run the COCOST program for each of the ten cases in Table 4. Outputs of these runs are shown in Appendix B. From the results, the most cost-effective systems for each shoulder width are extracted and tabulated in Table 5. Note that Type G2 at $S = 9$ ft gives the best results for both societal cost and total cost. The cheaper G1 system at $S = 4$ ft produces the best benefit-to-cost ratio.

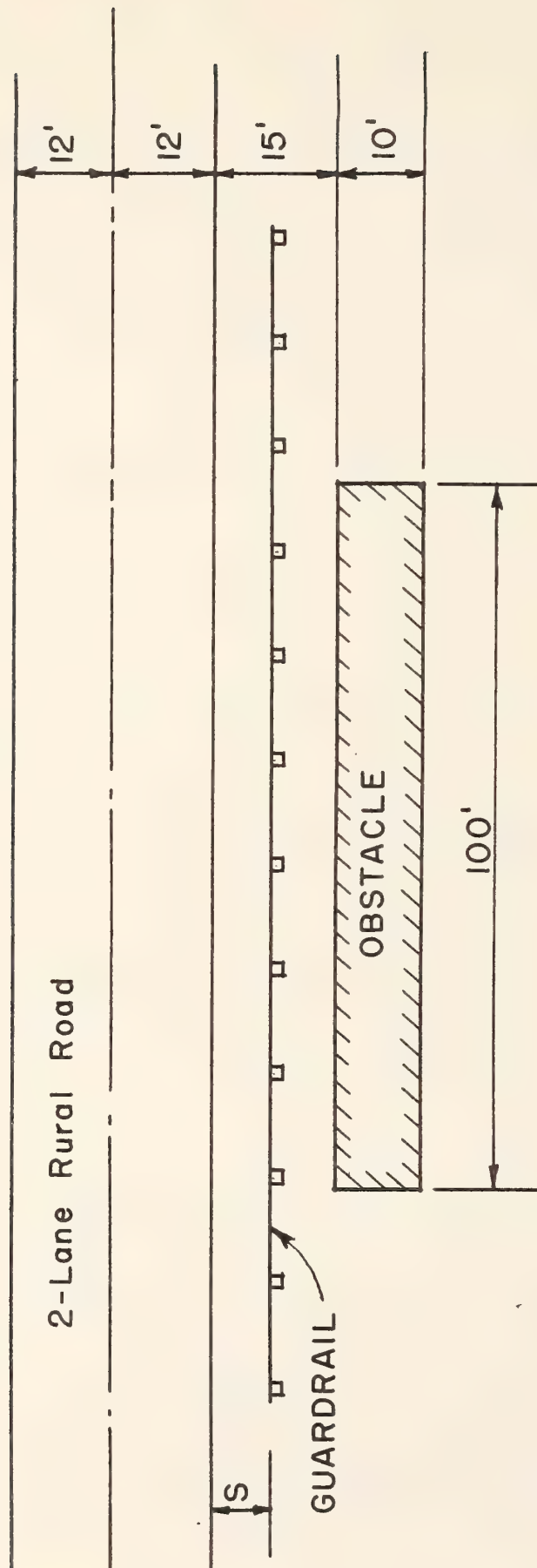


FIGURE 4. SAMPLE GUARDRAIL PLACEMENT CASE

TABLE 4. DETERMINATION OF LENGTHS OF NEED

Shoulder (ft)	Obstacle Length	Upstream			Downstream			Length of Need
		D	D + W	X _U	D	D + W	X _D	
no guardrail	100	21	31	52	33	43	48	200
3	100	9	31	125	21	43	86	311
4	100	10	31	116	22	43	83	299
5	100	11	31	108	23	43	79	287
6	100	12	31	101	24	43	75	276
7	100	13	31	94	25	43	72	266
8	100	14	31	87	26	43	69	256
9	100	15	31	81	27	43	66	247
10	100	16	31	75	28	43	63	238
11	100	17	31	70	29	43	60	230
12	100	18	31	65	30	43	57	222

TABLE 5. RESULTS OF ANALYSIS

Shoulder (ft)	Most Effective System By:					
	Societal Cost		Total Cost		Benefit/Cost Ratio	
	Type	Value	Type	Value	Type	Value
3	G2	\$ 910	G1	\$1868	G1	2.96
4	G2	857	G1	1761	G1	3.16
5	G2	799	G2	1957	G1	2.96
6	G2	755	G2	1868	G2	2.52
7	G2	704	G2	1777	G2	2.66
8	G2	667	G2	1700	G2	2.80
9	G2	627	G2	1623	G2	2.94
10	G4S	1302	A	2422	G2	2.17
11	G4S	1223	A	2293	A	2.32
12	Thrie	1243	C	2576	A	2.04
Conclusion: Use Type G2 at 9 ft for best societal cost. Use Type G2 at 9 ft for best total cost. Use Type G1 at 4 ft for best benefit/cost ratio.						

Priority Ranking

Consider that the 20 different sites shown in Table 6 are to be ranked for appropriation of limited funding. Again, the COCOST program is run for each of the 20 cases. The outputs are shown in Appendix C. From the combined results, the 20 most cost-effective guardrail systems are selected for whichever evaluation criteria is preferred. The systems are then placed in the order of decreasing cost effectiveness. For example, from the results shown in Appendix C, Tables 7, 8, and 9 are prepared to establish priorities by societal cost, total cost, and benefit/cost ratio, respectively. The state cost for each case is listed in the tables, and a cumulative state cost is prepared to determine the cut-off point for available funds. For example, if \$25,000 is available and the total cost criterion is selected, it can be seen from Table 8 that only the top 12 cases can be funded.

Note from these examples that the computer program is simply used to determine the rankings and corresponding values for each case. The various results must then be manipulated and combined to determine the optimum guardrail placement or establish the priority ranking.

TABLE 6. SAMPLE CASES FOR SETTING PRIORITIES

Case	Roadway Type	Shoulder Width	Guardrail-to-Obstacle Distance	Degree of Curve	AADT
1	2-lane rural	3	2	0	5,000
2	2-lane rural	3	2	0	10,000
3	2-lane rural	3	4	0	5,000
4	2-lane rural	3	4	10	5,000
5	2-lane rural	3	4	-10	5,000
6	2-lane rural	3	6	0	5,000
7	2-lane rural	4	6	0	5,000
8	2-lane rural	5	6	0	5,000
9	2-lane rural	6	6	0	5,000
10	2-lane rural	7	6	0	5,000
11	2-lane rural	8	6	0	5,000
12	4-lane rural	4	8	0	10,000
13	4-lane rural	6	6	0	10,000
14	4-lane rural	8	4	0	10,000
15	4-lane rural	10	2	0	10,000
16	freeway	6	6	0	10,000
17	freeway	8	6	0	10,000
18	freeway	10	6	0	10,000
19	freeway	12	6	0	10,000
20	freeway	12	6	0	20,000

Use guardrail length = 500 ft for all cases; obstacle length = 400 ft for all cases.

TABLE 7. PRIORITIES BY SOCIETAL COST

Rank	Case No.	Guardrail Type	Societal Cost	Case State Cost	Cumulative State Cost
1	19	G2	\$1133	\$2017	\$2017
2	18	G2	1233	2017	4034
3	11	G2	1303	2017	6051
4	10	G2	1341	2017	8068
5	17	G2	1355	2017	10,085
6	9	G2	1381	2017	12,102
7	8	G2	1418	2017	14,119
8	7	G2	1450	2017	16,136
9	6	G2	1474	2017	18,153
10	16	G2	1494	2017	20,170
11	5	G2	1499	2017	22,187
12	12	G2	1748	2017	24,204
13	13	G2	1837	2017	26,221
14	20	G2	2263	2017	28,238
15	3	G2	2683	2017	30,255
16	14	G2	2942	2017	32,272
17	1	Thrie	3580	3592	35,864
18	4	G4S	3610	3092	38,956
19	15	Thrie	3800	3592	42,548
20	2	Thrie	7345	3592	46,140

TABLE 8. PRIORITIES BY TOTAL COST

Rank	Case No.	Guardrail Type	Total Cost	Case State Cost	Cumulative State Cost
1	19	G2	\$3151	\$2017	\$2017
2	18	G2	3251	2017	4034
3	11	G2	3321	2017	6051
4	10	G2	3359	2017	8068
5	17	G2	3373	2017	10,085
6	9	G2	3398	2017	12,102
7	8	G2	3436	2017	14,119
8	7	G2	3467	2017	16,136
9	6	G2	3491	2017	18,153
10	16	G2	3512	2017	20,170
11	5	G2	3517	2017	22,187
12	12	G2	3765	2017	24,204
13	13	G2	3855	2017	26,221
14	20	G2	4280	2017	28,238
15	3	G2	4700	2017	30,255
16	14	G2	4959	2017	32,272
17	4	G2	5911	2017	34,289
18	1	C	6955	2342	36,631
19	15	C	7251	2342	38,973
20	2	Thrie	10,937	3592	42,565

TABLE 9. PRIORITIES BY BENEFIT/COST RATIO

Rank	Case No.	Guardrail Type	Benefit/Cost Ratio	Case State Cost	Cumulative State Cost
1	2	C	8.36	\$2342	\$ 2342
2	5	G2	5.36	2017	4359
3	20	G2	4.93	2017	6376
4	3	G2	4.77	2017	8393
5	6	G2	4.56	2017	10,410
6	12	G1	4.28	1392	11,802
7	7	G2	4.22	2017	13,819
8	4	G2	4.17	2017	15,836
9	1	C	4.10	2342	18,178
10	8	G2	3.90	2017	20,195
11	16	G2	3.86	2017	22,212
12	9	G2	3.62	2017	24,229
13	13	G2	3.48	2017	26,246
14	10	G2	3.36	2017	28,263
15	17	G2	3.31	2017	30,280
16	11	G2	3.12	2017	32,297
17	14	G2	2.94	2017	34,314
18	18	G2	2.85	2017	36,331
19	19	G2	2.46	2017	38,348
20	15	C	1.69	2342	40,690

VII. COMPUTER PROGRAM DESCRIPTIONS

SSCOST Program

The SSCOST program computes the state and societal costs for a specified guardrail type and roadway conditions. Program details are described in Appendix D. This section discusses program inputs and shows typical outputs.

Figure 5 is a worksheet that can be used to prepare SSCOST input. Figure 6 illustrates how the sets of input cards can be stacked for multiple runs. Set 1 corresponds to the data in the Figure 5 worksheet. The input values are entered as follows:

Card 1 (Format 10A8)

Columns 1-80. Enter appropriate title.

Card 2 (Format 8F10.0)

Columns 1-10. Enter highway type. Use

2.0 = 2-lane rural road

3.0 = 3-lane rural road

4.0 = 4-lane rural road

5.0 = 4-lane freeway

6.0 = 6-lane freeway

7.0 = 8-lane freeway

Columns 11-20. Enter guardrail type. Use

1.0 = Type A

2.0 = Type B

3.0 = Type C

4.0 = Type D

5.0 = Type E

6.0 = Type G1

7.0 = Type G2

8.0 = Type G3

9.0 = Type G4S

10.0 = Type G4W

11.0 = Type THRIE

Columns 21-30. Enter guardrail length of need in feet (see Section IV).

Columns 31-40. Enter AADT.

Columns 41-50. Enter fraction of traffic for 2250-lb vehicles.

Columns 51-60. Enter fraction of traffic for 4500-lb vehicles.

Columns 61-70. Enter highway division. Use

0.0 = undivided highway

1.0 = divided highway

Columns 71-80. Enter FHWA region number.

Card 3 (Format 5F10.0)

Columns 1-10. Enter left offset distance in feet (see Figure 7).

Columns 11-20. Enter right offset distance in feet (see Figure 7).

Columns 21-30. Enter degree of horizontal curve. Use

+ = curves bending to left

- = curves bending to right

Column	10	20	30	40	50	60	70	80
Card 1 Format (10A8):								
<u>2-Lane</u>	<u>Road, AADT=5,000, Guardrail Type A, Low Fatality Cost</u>							
Title								
Card 2 Format (8F10.0):								
<u>2.0</u>	<u>1.0</u>	<u>500.0</u>	<u>5000.</u>	<u>0.25</u>	<u>0.75</u>	<u>0.0</u>	<u>6.0</u>	
Highway type	Guardrail type	Guardrail length	AADT	Fraction of traffic for 2250-lb vehicles	Fraction of traffic for 4500-lb vehicles	Highway division	FHWA region	
Card 3 Format (5F10.0):								
<u>24.0</u>	<u>12.0</u>	<u>0.0</u>	<u>4.0</u>	<u>400.0</u>				
Left offset distance	Right offset distance	Degree of curve	Guardrail-to-obstacle distance	Obstacle length				
Card 4 Format (2F10.0):								
<u>1.0</u>	<u>10.0</u>							
Time to remove damaged vehicle	Time to repair damaged guard-rail							
Card 5 Format (8F10.0):								
<u>3500.00</u>	<u>33100.00</u>	<u>4.50</u>	<u>4.50</u>	<u>0.00</u>	<u>3200.00</u>	<u>5300.00</u>	<u>10.00</u>	
Cost of injury	Cost of fatality	Cost of installation	Cost of repair	Cost of maintenance	2250-lb vehicle cost	4500-lb vehicle cost	Cost of traffic delay	
Card 6 Format (4F10.0):								
<u>15.0</u>	<u>80</u>	<u>500.0</u>	<u>0.0</u>					
Service life	Interest rate	Total salvage value	Print flag					

FIGURE 5. SSCOST INPUT WORKSHEET

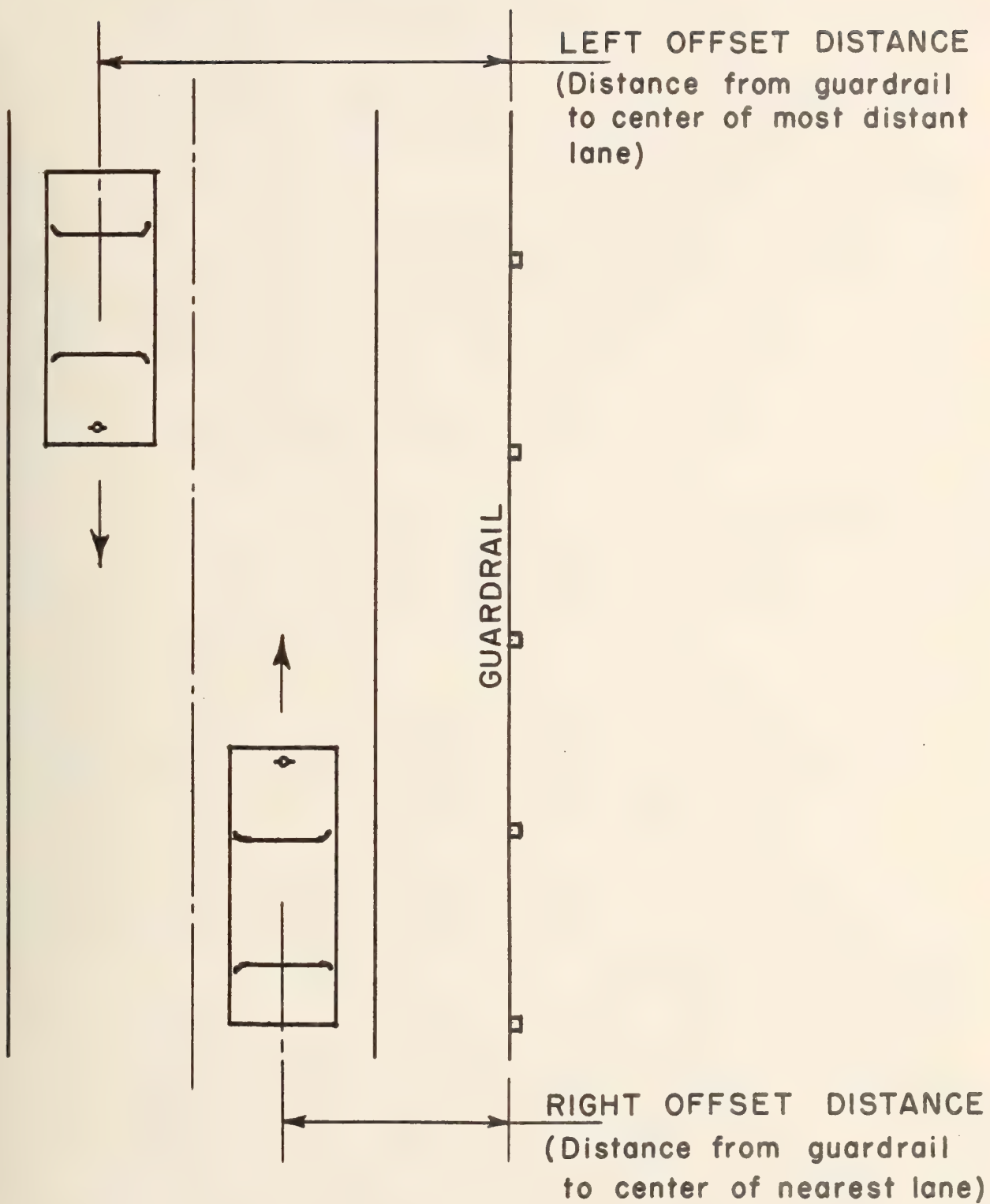


FIGURE 7. OFFSET DISTANCE DEFINITIONS

- Columns 31-40. Enter distance from guardrail face to obstacle in feet for fixed obstacles. If guardrail protects an embankment, enter 0.0.
- Columns 41-50. Enter obstacle exposure length in feet (see Section IV).

Card 4 (Format 2F10.0)

- Columns 1-10. Enter time to remove damaged vehicle in hours.
- Columns 11-20. Enter time to repair damaged guardrail in hours.

Card 5 (Format 8F10.0)

- Columns 1-10. Enter cost of injury in dollars.
- Columns 11-20. Enter cost of fatality in dollars.
- Columns 21-30. Enter cost of guardrail installation in dollars per foot. Include costs of end anchors and terminals. For example, if the guardrail system (500 ft required) costs \$5.00 per ft, end anchors (2 required) cost \$200 each, and terminal sections (2 required) cost \$400 each, enter

$$\frac{500(5.00) + 200(2) + 400(2)}{500} = \$7.40 \text{ per ft}$$

- Columns 31-40. Enter cost of guardrail repair in dollars per ft.
- Columns 41-50. Enter cost of guardrail maintenance in dollars per ft per year.
- Columns 51-60. Enter cost of 2250-lb vehicle in dollars.
- Columns 61-70. Enter cost of 4500-lb vehicle in dollars.
- Columns 71-80. Enter unit cost of travel delay in dollars per hour per vehicle.

Card 6 (Format 4F10.0)

- Columns 1-10. Enter service life in years.
- Columns 11-20. Enter current interest rate in percent.
- Columns 21-30. Enter estimate of total salvage value at end of service life in dollars.
- Columns 31-40. Enter print flag. Use
- 0.0 for complete 6-page output (see below)
 - 1.0 for printout of only "Sheet 6. Cost Summary" (see below)

Output sheets for the two sets of Figure 6 input data are shown in Figures 8 and 9, respectively. With a print flag of 0.0 in Columns 31-40 of Card 6, the output for Set 1 includes the six sheets shown in Figure 8. If all of this information is not desired, a print flag of 1.0 (see Set 2) will yield only the cost summary sheet shown in Figure 9.

COCOST Program

The COCOST program computes the associated costs and ranks the eleven guardrail types of Table 1 for specified roadway conditions. The ranking criteria include state cost, societal cost, total cost, and benefit-to-cost ratio. Program details are described in Appendix E. This section discusses program inputs and shows typical outputs.

Figure 10 is a worksheet that can be used to prepare COCOST input. Figure 11 illustrates how the sets of input cards can be stacked for multiple runs. Set 1 corresponds to the data in the Figure 10 worksheet. The input values are entered as follows:

Card 1 (Format 10A8)

- Columns 1-80. Enter appropriate title.

SHEET 1. INPUT INFORMATION

HIGHWAY TYPE = 2, WHERE

2 = 2-LANE RURAL

3 = 3-LANE RURAL

4 = 4-LANE RURAL

5 = 4-LANE FREEWAY

6 = 6-LANE FREEWAY

7 = 8-LANE FREEWAY

HIGHWAY IS UNDIVIDED

AADT = 5000. VEHICLES PER DAY

TRAFFIC MIX

2250-LB VEHICLES = 25. PERCENT

4500-LB VEHICLES = 75. PERCENT

EXPECTED NUMBER OF ENCROACHMENTS PER YEAR

2250-LB VEHICLES = .0355

4500-LB VEHICLES = .1085

GUARDRAIL SITE CONDITIONS

GUARDRAIL TYPE = 1, WHERE

1 = TYPE A

2 = TYPE B

3 = TYPE C

4 = TYPE D

5 = TYPE E

6 = TYPE G1

7 = TYPE G2

8 = TYPE G3

9 = TYPE G4S

10 = TYPE G4W

11 = THREE BEAM

LENGTH-OF-NEED FOR GUARDRAIL = 500. FEET

GUARDRAIL-TO-OBSTACLE DISTANCE = 4. FEET

LEFT OFFSET DISTANCE = 24. FEET

RIGHT OFFSET DISTANCE = 12. FEET

DEGREE OF CURVE = 0.

FIGURE 8. SSCOST SET 1 OUTPUT SHEETS

2-LANE ROAD, AADT = 5,000, GUARDRAIL TYPE A, LOW FATALITY COST

SHEET 2. PROBABILITIES AND EXPECTED NUMBER OF IMPACTS

 *
 * OFFSET (LEFT) = 24. FEET *
 * OFFSET (RIGHT) = 12. FEET *
 *
 * DEGREE OF CURVE = 0. *
 *

SPEED (MPH)	IMPACT ANGLE (DEGREES)	PROBABILITY (LEFT)	PROBABILITY (RIGHT)	NO. OF IMPACTS	
				2250-LB VEHICLES	4500-LB VEHICLES
30.	7.	.00017	.00404	.00015	.00045
30.	15.	.00381	.07354	.00275	.00824
30.	25.	.01421	.04701	.00235	.00705
30.	30.	.02442	.00084	.00104	.00328

95 PERCENTILE IMPACT ANGLE = 44.13 DEGREES ON LEFT
 95 PERCENTILE IMPACT ANGLE = 26.27 DEGREES ON RIGHT

50.	7.	.00231	.05072	.00188	.00565
50.	15.	.04457	.14102	.00654	.01977
50.	25.	.03363	.00060	.00122	.00365
50.	30.	.00040	.00000	.00003	.00010

95 PERCENTILE IMPACT ANGLE = 26.46 DEGREES ON LEFT
 95 PERCENTILE IMPACT ANGLE = 16.78 DEGREES ON RIGHT

70.	7.	.00534	.06812	.00261	.00783
70.	15.	.03331	.02681	.00213	.00640
70.	25.	.00144	.00000	.00005	.00016
70.	30.	.00000	.00000	.00000	.00000

95 PERCENTILE IMPACT ANGLE = 19.53 DEGREES ON LEFT
 95 PERCENTILE IMPACT ANGLE = 12.35 DEGREES ON RIGHT

FIGURE 8. SSCOST SET 1 OUTPUT SHEETS (Cont'd)

2-LANE ROAD, ADT = 5,000, GUARDRAIL TYPE A, LOW FATALITY COST

SHEET 3. YEARLY ACCIDENT SEVERITIES FOR 2250-LB VEHICLES

SPEED (MPH)	IMPACT ANGLE (DEGREES)	NO. OF INJURIES	NO. OF FATALITIES	GUARDRAIL DAMAGE (FT)	VEHICLE DAMAGE	MAXIMUM DYNAMIC DEFLECTION (FT)
30.	7.	0.00000	0.00000	.00187	.00001	.16
30.	15.	0.00000	0.00000	.03433	.00041	.39
30.	25.	.00235	0.00000	.02439	.00059	.83
30.	30.	.00109	0.00000	.01368	.00027	1.11
50.	7.	0.00000	0.00000	.02354	.00028	.35
50.	15.	.00659	0.00000	.08238	.00165	.82
50.	25.	.00122	0.00000	.03039	.00049	1.90
50.	30.	0.00000	.00003	.00080	.00001	2.17
70.	7.	.00261	0.00000	.03263	.00052	.45
70.	15.	0.00000	.00213	.08006	.00064	2.05
70.	25.	0.00000	.00005	.00198	.00002	2.90
70.	30.	0.00000	.00000	.00000	.00000	3.58
TOTALS		.01396	.00222	.33107	.00490	

FIGURE 8. SSCOST SET 1 OUTPUT SHEETS (Cont'd)

2-LANE ROAD, AADT = 5,000, GUARDRAIL TYPE A, LOW FATALITY COST

SHEET 4. YEARLY ACCIDENT SEVERITIES FOR 4500-LB VEHICLES

SPEED (MPH)	IMPACT ANGLE (DEGREES)	NO. OF INJURIES	NO. OF FATALITIES	GUARDRAIL DAMAGE (FT)	VEHICLE DAMAGE	MAXIMUM DYNAMIC DEFLECTION (FT)
30.	7.	0.00000	0.00000	.00561	.00004	.22
30.	15.	0.00000	0.00000	.10300	.00165	.63
30.	25.	0.00000	0.00000	.17636	.00176	1.57
30.	30.	.00328	0.00000	.04104	.00048	1.91
50.	7.	0.00000	0.00000	.07063	.00113	.42
50.	15.	.01977	0.00000	.74144	.00444	2.03
50.	25.	.00365	0.00000	.13676	.00104	2.78
50.	30.	.00010	0.00000	.00361	.00003	3.96
70.	7.	.00783	0.00000	.19579	.00235	.53
70.	15.	.00640	0.00000	.32023	.00224	3.08
70.	25.	.00008	.00008	.00991	.00008	5.60
70.	30.	.00000	.00000	.00000	.00000	7.47
TOTALS		.04111	.00008	1.90438	.01631	

FIGURE 8. SSCOST SET 1 OUTPUT SHEETS (Cont'd)

SHEET 5. TRAFFIC DELAY

ESTIMATED TIME TO REMOVE DAMAGED VEHICLE = 1.0 HOURS

ESTIMATED TIME TO REPAIR DAMAGED GUARDRAIL = 10.0 HOURS

TRAFFIC DELAY CAUSED BY ACCIDENT BLOCKAGE = 6.4 HOURS

TRAFFIC DELAY CAUSED BY REPAIR CONGESTION = 23.0 HOURS

TOTAL TRAFFIC DELAY = 29.4 HOURS

SPEED (MPH)	IMPACT ANGLE (DEGREES)	TOTAL NO. OF EXPECTED IMPACTS	PROBABILITY OF BLOCKAGE	TRAFFIC DELAY (VEHICLE-HOURS)
30.	7.	.00060	.32	.00563
30.	15.	.01099	.22	.07111
30.	25.	.00991	.18	.04981
30.	30.	.00438	.14	.01803
50.	7.	.00753	.32	.07093
50.	15.	.02636	.22	.17063
50.	25.	.00486	.18	.02575
50.	30.	.00013	.14	.00053
70.	7.	.01044	.32	.09831
70.	15.	.00854	.22	.05527
70.	25.	.00021	.18	.00112
70.	30.	.00000	.14	.00000
TOTAL				.56713

HIGHWAY OPERATING SPEED AT THIS ADT = 46.1 MPH

FIGURE 8. SSCOST SET 1 OUTPUT SHEETS (Cont'd)

SHEET 6. COST SUMMARY

FHWA REGION = 6 GUARDRAIL TYPE = A

NO. OF FATALITIES = .00230 AT 33100. DOLLARS EACH = 76.10

2250-LB VEHICLE DAMAGE = .00490 UNITS AT 3200. DOLLARS EACH = 15.68

TRAVEL DELAY = .56713 VEHICLE-HOURS AT 10.00 DOLLARS EACH = 5.67

[illegible]

YEARLY MAINTENANCE = 500. FEET AT 0.00 DOLLARS PER FT = 0.00

DATE	DESCRIPTION	AMOUNT	BALANCE
10/1/80	SALES	100.00	100.00
10/5/80	SALES	200.00	300.00
10/10/80	SALES	150.00	450.00
10/15/80	SALES	100.00	550.00
10/20/80	SALES	50.00	600.00
10/25/80	SALES	50.00	650.00
10/30/80	SALES	50.00	700.00
11/5/80	SALES	50.00	750.00
11/10/80	SALES	50.00	800.00
11/15/80	SALES	50.00	850.00
11/20/80	SALES	50.00	900.00
11/25/80	SALES	50.00	950.00
11/30/80	SALES	50.00	1000.00
12/5/80	SALES	50.00	1050.00
12/10/80	SALES	50.00	1100.00
12/15/80	SALES	50.00	1150.00
12/20/80	SALES	50.00	1200.00
12/25/80	SALES	50.00	1250.00
12/30/80	SALES	50.00	1300.00
1/5/81	SALES	50.00	1350.00
1/10/81	SALES	50.00	1400.00
1/15/81	SALES	50.00	1450.00
1/20/81	SALES	50.00	1500.00
1/25/81	SALES	50.00	1550.00
1/30/81	SALES	50.00	1600.00
2/5/81	SALES	50.00	1650.00
2/10/81	SALES	50.00	1700.00
2/15/81	SALES	50.00	1750.00
2/20/81	SALES	50.00	1800.00
2/25/81	SALES	50.00	1850.00
2/28/81	SALES	50.00	1900.00
3/5/81	SALES	50.00	1950.00
3/10/81	SALES	50.00	2000.00
3/15/81	SALES	50.00	2050.00
3/20/81	SALES	50.00	2100.00
3/25/81	SALES	50.00	2150.00
3/30/81	SALES	50.00	2200.00
4/5/81	SALES	50.00	2250.00
4/10/81	SALES	50.00	2300.00
4/15/81	SALES	50.00	2350.00
4/20/81	SALES	50.00	2400.00
4/25/81	SALES	50.00	2450.00
4/30/81	SALES	50.00	2500.00
5/5/81	SALES	50.00	2550.00
5/10/81	SALES	50.00	2600.00
5/15/81	SALES	50.00	2650.00
5/20/81	SALES	50.00	2700.00
5/25/81	SALES	50.00	2750.00
5/30/81	SALES	50.00	2800.00
6/5/81	SALES	50.00	2850.00
6/10/81	SALES	50.00	2900.00
6/15/81	SALES	50.00	2950.00
6/20/81	SALES	50.00	3000.00
6/25/81	SALES	50.00	3050.00
6/30/81	SALES	50.00	3100.00
7/5/81	SALES	50.00	3150.00
7/10/81	SALES	50.00	3200.00
7/15/81	SALES	50.00	3250.00
7/20/81	SALES	50.00	3300.00
7/25/81	SALES	50.00	3350.00
7/30/81	SALES	50.00	3400.00
8/5/81	SALES	50.00	3450.00
8/10/81	SALES	50.00	3500.00
8/15/81	SALES	50.00	3550.00
8/20/81	SALES	50.00	3600.00
8/25/81	SALES	50.00	3650.00
8/30/81	SALES	50.00	3700.00
9/5/81	SALES	50.00	3750.00
9/10/81	SALES	50.00	3800.00
9/15/81	SALES	50.00	3850.00
9/20/81	SALES	50.00	3900.00
9/25/81	SALES	50.00	3950.00
9/30/81	SALES	50.00	4000.00
10/5/81	SALES	50.00	4050.00
10/10/81	SALES	50.00	4100.00
10/15/81	SALES	50.00	4150.00
10/20/81	SALES	50.00	4200.00
10/25/81	SALES	50.00	

PRESENT VALUE OF FUTURE DOLLAR = .3152
PRESENT VALUE OF YEARLY ANNUITY = 8.5595

* TOTAL GOVERNMENT/STATE PRESENT WORTH COST *	* TOTAL SOCIETAL PRESENT WORTH COST *
* INSTALLATION * 2950.00 *	* ACCIDENT DAMAGE * 3254.67 *
* MAINTENANCE * 0.00 *	* TRAFFIC DELAY * 48.54 *
* LESS SALVAGE VALUE * 157.62 *	
* TOTAL * 2092.38 *	* TOTAL * 3303.22 *
* SOCIETAL COST WITH NO GUARDRAIL * 9559.85 *	* TOTAL OF STATE AND SOCIETAL COSTS * 5945.60 *
* BENEFIT * 6656.63 *	* BENEFIT-TO-COST RATIO * 3.18 *

FIGURE 8. SSCOST SET 1 OUTPUT SHEETS (Cont'd)

2-LANE ROAD, AADT = 5,000, GUARDRAIL TYPE A, MIDDLE FATALITY COST

SHEET 6. COST SUMMARY

YEARLY ACCIDENT COSTS

FHWA REGION = 6 GUARDRAIL TYPE = A

NO. OF INJURIES = .05498 AT 6500. DOLLARS EACH = 357.34

NO. OF FATALITIES = .00230 AT 102460. DOLLARS EACH = 235.57

BARRIER DAMAGE = 2.13545 FEET AT 4.50 DOLLARS PER FT = 9.61

2250-LB VEHICLE DAMAGE = .00490 UNITS AT 3200. DOLLARS EACH = 15.68

4500-LB VEHICLE DAMAGE = .01631 UNITS AT 5300. DOLLARS EACH = 86.43

TRAVEL DELAY = .56713 VEHICLE-HOURS AT 10.00 DOLLARS EACH = 5.67

TOTAL YEARLY SOCIETAL COST = 710.31

GUARDRAIL INSTALLATION = 500. FEET AT 4.50 DOLLARS PER FT = 2250.00

YEARLY MAINTENANCE = 500. FEET AT 0.00 DOLLARS PER FT = 0.00

SALVAGE VALUE = 500.00

ECONOMIC FACTORS FOR 15-YEAR SERVICE LIFE AT 8. PERCENT INTEREST

PRESENT VALUE OF FUTURE DOLLAR = .3152

PRESENT VALUE OF YEARLY ANNUITY = 8.5595

TOTAL GOVERNMENT/STATE PRESENT WORTH COST

INSTALLATION 2250.00

MAINTENANCE 0.00

LESS SALVAGE VALUE 157.62

TOTAL 2092.38

TOTAL SOCIETAL PRESENT WORTH COST

ACCIDENT DAMAGE 6031.33

TRAFFIC DELAY 48.54

TOTAL 6079.88

SOCIETAL COST WITH NO GUARDRAIL

25532.69

TOTAL OF STATE AND SOCIETAL COSTS

8172.26

BENEFIT

14452.81

BENEFIT-TO-COST RATIO

9.30

FIGURE 9. SSCOST SET 2 OUTPUT SHEET

Column	10	20	30	40	50	60	70	80
Card 1 Format (10A8):								
Title	2-Lane Rural Road, AADT=5000, I = \$3500 and F=\$33,100							
Card 2 Format (515). Flag card for changes in preset input values.								
Use blank card for no changes in present input values <input checked="" type="checkbox"/> X								
Enter 1 in Column 5 for changes in present input values								
Enter 1 in Column 10 for changes in guardrail costs								
Enter 1 in Column 15 for changes in travel delay								
Enter 1 in Column 20 for changes in injury, fatality, or vehicle costs								
Enter 1 in Column 25 for changes in service life or interest rate								
Card 2a Format (2F10.0). Include if 1 is punched in Column 5 of Card 2.								
Fraction of traffic for 2250-lb vehicles								
Cards 2b Format (8F10.0). Include if 1 is punched in Column 10 of Card 2.								
Unit cost of guardrail A	Unit cost of guardrail B	Unit cost of guardrail C	Unit cost of guardrail D	Unit cost of guardrail E	Unit cost of guardrail G1	Unit cost of guardrail G2	Unit cost of guardrail G3	
Unit cost of guardrail G4S	Unit cost of guardrail G4W	Unit cost of guardrail Thrie	Unit yearly maintenance cost	Unit salvage value				
Card 2c Format (3F10.0). Include if 1 is punched in Column 15 of Card 2.								
Time to remove damaged vehicle	Time to repair damaged guard-rail	Unit cost of traffic delay						
Card 2d Format (4F10.0). Include if 1 is punched in Column 20 of Card 2.								
Cost of injury	Cost of fatality	2250-lb vehicle cost	4500-lb vehicle cost					
Card 2e Format (2F10.0). Include if 1 is punched in column 25 of Card 2.								
Service life	Interest rate							
Card 3 Format (7F10.0):								
Highway type	Highway division	Left offset distance	Right offset distance	Degree of curve	Guardrail-to-obstacle distance	Pavement-to-guardrail distance		
2.0	0.0	24.0	12.0	0.0	4.0	6.0		
Card 4 Format (4F10.0):								
Guardrail length	Obstacle length	AADT	Final degree of curve					
500.0	400.0	5000.	0.0					

FIGURE 10. COCOST INPUT WORKSHEET

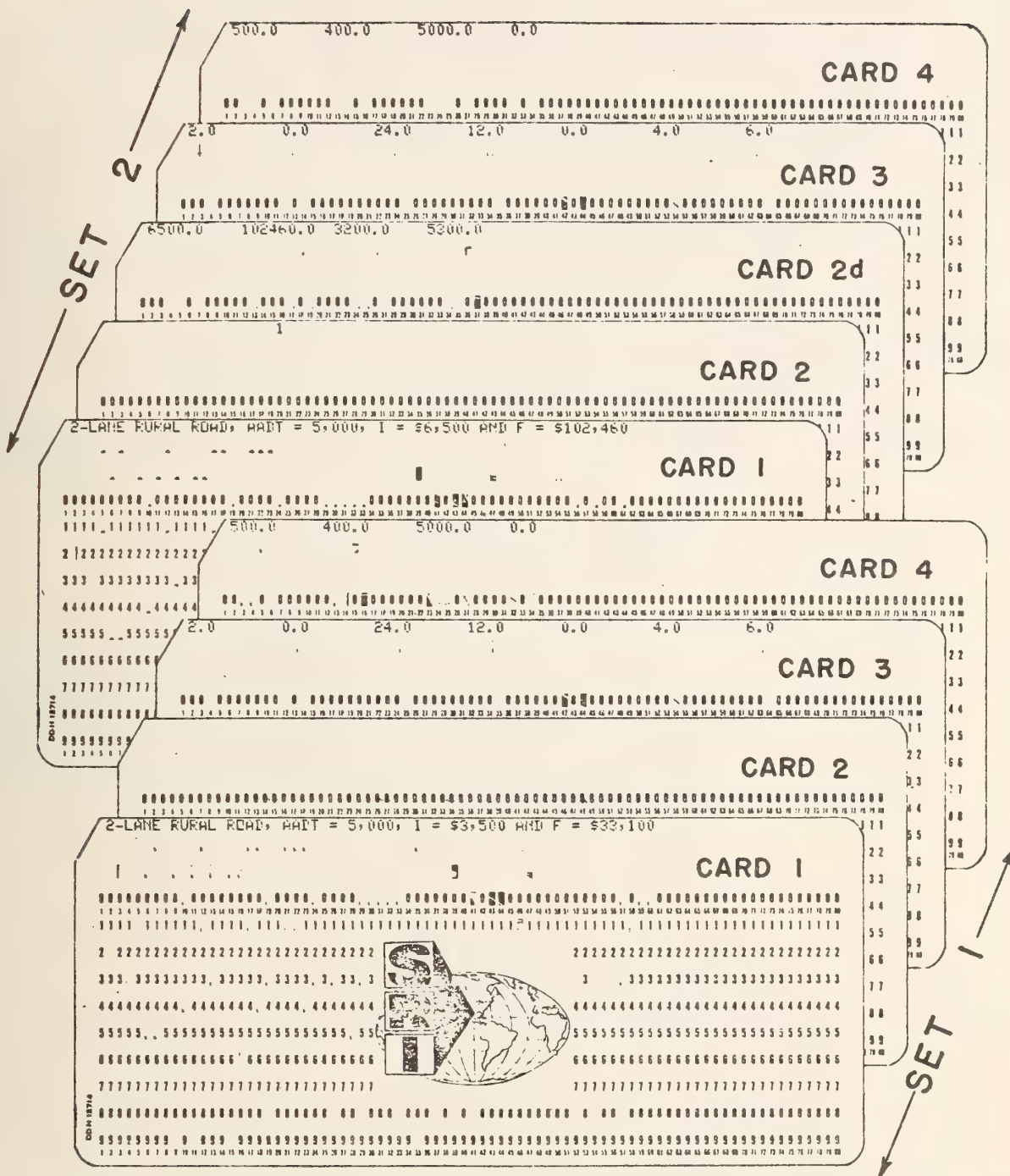


FIGURE 11. COCOST INPUT DECK

Card 2 (Format 515). The various representative costs and input values discussed in Section V have been preset in the COCOST program. These values are shown within the starred lines on page 1 of the computer listing in Appendix E. For changes of these inputs to local values, the user can either (1) simply change the preset cards or (2) insert a change flag on Card 2. For the first option, use a blank card for Card 2. For the second option, use

- blank card for no changes in preset input values
- 1 in Column 5 for changes in traffic mix
(requires card 2a below)
- 1 in Column 10 for changes in guardrail costs
(requires cards 2b below)
- 1 in Column 15 for changes in travel delay
(requires card 2c below)
- 1 in Column 20 for changes in injury, fatality, or vehicle costs
(requires card 2d below)
- 1 in Column 25 for changes in service life or interest rate
(requires card 2e below)

These changes can be made singly or in combination (e.g., 1 in Column 10 and 1 in Column 15 indicate change cards 2b for guardrail costs and 2c for travel delay will follow).

Card 2a (Format 2F10.0). Include this card if 1 is punched in Column 5 of card 2.

Columns 1-10. Enter fraction of traffic for 2250-lb vehicles.

Columns 11-20. Enter fraction of traffic for 4500-lb vehicles.

Cards 2b (Format 8F10.0). Include these cards if 1 is punched in Column 10 of Card 2.

Columns 1-10, 11-20, 21-30, 31-40, 41-50, 51-60, 61-70, 71-80 (1st card). Enter installation costs in dollars per foot for guardrail types A, B, C, D, E, G1, G2, G3, respectively. Include costs of end anchors and terminals. For example, if a guardrail system (500 feet required) costs \$5.00 per ft, end anchors (2 required) cost \$200 each, and terminal sections (2 required) cost \$400 each, enter

$$\frac{500(5.00) + 200(2) + 400(2)}{500} = \$7.40 \text{ per ft.}$$

Columns 1-10, 11-20, 21-30 (2nd card). Enter installation costs in dollars per foot for guardrail types G4S, G4W, Thrie, respectively.

Note: Installation costs must be specified for each of the 11 guardrail types. If a state does not use certain types, high costs (say, \$100 per ft) can be used to force these types to the low end of the ranking scale.

Columns 31-40 (2nd card). Enter yearly maintenance cost for the guardrails in dollars per foot.

Note: The same unit maintenance cost is used for all of the guardrail types.

Columns 41-50 (2nd card). Enter estimate of unit salvage value in dollars per foot.

Note: The same unit salvage value is used for all of the guardrail types.

Card 2c (Format 3F10.0). Include this card if 1 is punched in Column 15 of card 2.

Columns 1-10. Enter time to remove damaged vehicle in hours.

- Columns 11-20. Enter time to repair damaged guardrail in hours.
Columns 21-30. Enter unit cost of travel delay in dollars per hour per vehicle.

Card 2d (Format 4F10.0). Include this card if 1 is punched in Column 20 of card 2.

- Columns 1-10. Enter cost of injury in dollars.
Columns 11-20. Enter cost of fatality in dollars.
Columns 21-30. Enter cost of 2250-lb vehicle in dollars.
Columns 31-40. Enter cost of 4500-lb vehicle in dollars.

Card 2e (Format 2F10.0). Include this card if 1 is punched in Column 25 of card 2.

- Columns 1-10. Enter service life in years.
Columns 11-20. Enter current interest rate in percent.

NOTE: When changes are desired for a particular group of data, all of the quantities in that group must be specified. For example, in Set 2 of Figure 11, only the cost of injury and cost of fatality are changed on Card 2d from the previous run. However, the card must be completed. Thus, the 2250-lb vehicle cost and 4500-lb vehicle cost are also punched on the card even though they are not changed.

Card 3 (Format 7F10.0)

- Columns 1-10. Enter highway type. Use
2.0 = 2-lane rural road
3.0 = 3-lane rural road
4.0 = 4-lane rural road
5.0 = 4-lane freeway
6.0 = 6-lane freeway
7.0 = 8-lane freeway
Columns 11-20. Enter highway division. Use
0.0 = undivided highway
1.0 = divided highway
Columns 21-30. Enter left offset distance in feet (see Figure 7).
Columns 31-40. Enter right offset distance in feet (see Figure 7).
Columns 41-50. Enter degree of horizontal curve. Use
+ = curves bending to left
- = curves bending to right

Columns 51-60. Enter distance from guardrail face to obstacle in feet for fixed obstacle.
If guardrail protects an embankment, enter 0.0.
Columns 61-70. Enter distance from edge of pavement to guardrail face in feet.

Card 4 (Format 4F10.0)

- Columns 1-10. Enter guardrail length of need in feet (see Section IV).
Columns 11-20. Enter obstacle exposure length in feet (see Section IV).
Columns 21-30. Enter AADT.
Columns 31-40. Enter final degree of curve if various degrees of curve are desired. For example, the tables of Appendix A were prepared by entering a starting value 10.0° in Columns 41-50 of Card 3 and a final value of -8.0 in this space. As shown in Appendix A, the curvature is reduced by 2° for each run until the final value is reached. For a single run, enter the same value in this space as specified in Columns 41-50 of Card 3.

The output results for Set 1 and Set 2 data in Figure 11 are shown in Figures 12 and 13, respectively. Note that the first output sheet lists input values for checking purposes. The second sheet lists the guardrail types in the order of decreasing preference (the best is number 1 and the worst is number 11) for the indicated criteria of state cost, societal cost, total cost, and benefit-to-cost ratio. It is the user's option to select the ranking criteria.

Note that the SSCOST runs of Figures 8 and 9 correspond to the COCOST runs of Figures 12 and 13. Thus, it can be seen, for example, that the values for state cost, societal cost, total cost, and benefit-to-cost ratio shown in Figure 12 for guardrail A are identical to the values shown in Figure 8. However, as noted earlier, the SSCOST run of Figure 8 is for the single guardrail types. Thus, it would be expected that the COCOST program will find more predominant use in cost-effectiveness analyses.

VALUES OF INPUT PARAMETERS

2-LANE RURAL ROAD, ADOT = \$5,000, I = \$3,500 AND F = \$33,100

TRAFFIC MIX	
FRACTION OF 2250-LB VEHICLES	.25
FRACTION OF 4500-LB VEHICLES	.75
GUARDRAIL COSTS	
INSTALLATION AND REPAIR	
TYPE A	4.50 \$/FT
B	6.00
C	5.00
D	6.25
E	6.10
G1	3.10
G2	4.35
G3	13.50
G4S	6.50
G4M	6.50
THRIE	7.50
YEARLY MAINTENANCE	0.00 \$/FT
SALVAGE VALUE	1.00 \$/FT
TRAVEL DELAY	
TIME TO REMOVE DAMAGED VEHICLE	1.00 HOURS
TIME TO REPAIR DAMAGED GUARDRAIL	10.00 HOURS
TRAFFIC DELAY COST	10.00 \$/HOUR
INJURY, FATALITY, AND VEHICLE COSTS	
COST OF INJURY	3500. DOLLARS
COST OF FATALITY	33100.
COST OF 2250-LB VEHICLE	3200.
COST OF 4500-LB VEHICLE	5300.
ECONOMIC FACTORS	
SERVICE LIFE	15. YEARS
RATE OF INTEREST	9. PERCENT

FIGURE 12. COCOST SET 1 OUTPUT SHEETS

SUMMARY OF RESULTS 2-LANE RURAL ROAD, AADT = 5,000, I = \$3,500 AND F = \$33,100

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 10 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 9959.85

AADT = 5000 GUARDRAIL LENGTH = 500 FT OBSTACLE LENGTH = 400 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4M	G4S	THRIE	G3
VALUES	1392.38	2017.38	2092.38	2342.38	2842.38	2842.38	2967.38	3092.38	3092.38	3592.38	6592.38
SOCIETAL COST	G2	G4S	D	A	THRIE	G3	C	E	B	G4M	G1
VALUES	2966.92	3050.44	3214.22	3303.22	3310.41	3668.33	3802.15	3912.44	4394.06	4403.70	12171.52
TOTAL COST	G2	A	G4S	C	D	E	THRIE	B	G4M	G3	G1
VALUES	4984.24	5395.60	6142.82	6144.52	6181.60	6804.82	6902.74	7236.44	7496.08	10260.71	13563.90
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4M	G3	G1
VALUES	3.47	3.18	2.63	2.27	2.23	2.09	1.46	1.85	1.80	.95	-1.54

FIGURE 12. COCOST SET 1 OUTPUT SHEETS (Cont'd)

VALUES OF INPUT PARAMETERS

2-LANE RURAL ROAD, AADT = 5,000, I = 86,500 AND F = \$102,460

TRAFFIC MIX

FRACTION OF 2250-LB. VEHICLES	.25
FRACTION OF 4500-LB VEHICLES	.75

GUARDRAIL COSTS

INSTALLATION AND REPAIR

TYPE A	4.50 \$/FT
B	6.00
C	5.00
D	6.25
E	6.10
G1	3.10
G2	4.35
G3	13.50
G4S	6.50
G4M	6.50
THRIE	7.50
YEARLY MAINTENANCE	0.00 \$/FT
SALVAGE VALUE	1.00 \$/FT

TRAVEL DELAY

TIME TO REMOVE DAMAGED VEHICLE	1.00 HOURS
TIME TO REPAIR DAMAGED GUARDRAIL	10.00 HOURS
TRAFFIC DELAY COST	10.00 \$/HOUR

INJURY, FATALITY, AND VEHICLE COSTS

COST OF INJURY	6500. DOLLARS
COST OF FATALITY	102460.
COST OF 2250-LB VEHICLE	3200.
COST OF 4500-LB VEHICLE	5300.

ECONOMIC FACTORS

SERVICE LIFE	15. YEARS
RATE OF INTEREST	8. PERCENT

FIGURE 13. COCOST SET 2 OUTPUT SHEETS

SUMMARY OF RESULTS 2-LANE RURAL ROAD, AADT = 5,000, I = \$6,500 AND F = \$102,460

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 10 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 25532.69

AADT = 5000 GUARDRAIL LENGTH = 500 FT OBSTACLE LENGTH = 400 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0	STATE COST	G1	G2	A	C	B	E	D	G49	THRIE	G3
	VALUES	1392.38	2017.38	2092.38	2342.38	2842.38	2892.38	2967.38	3092.38	3592.38	6592.38
	SOCIETAL COST	G48	O	A	THRIE	G2	G3	E	B	G4M	G1
	VALUES	4606.07	4971.75	6079.88	6268.22	6498.14	6653.50	7346.20	7450.44	8079.35	32864.37
	TOTAL COST	G48	O	A	G2	C	THRIE	E	B	G3	G1
	VALUES	7699.25	7939.13	8172.26	8515.52	9792.82	9860.60	10288.58	10912.09	11171.73	13245.87
	BENEFIT/COST	G2	A	C	D	G49	E	B	G4M	THRIE	G3
	VALUES	9.44	9.30	7.72	6.93	6.77	6.27	6.14	5.64	2.86	-5.27

FIGURE 13. COCOST SET 2 OUTPUT SHEETS (Cont'd)

REFERENCES

1. J. C. Glennon, and T. N. Tamburri, "Objective Criteria for Guardrail Installation," California Division of Highways, Traffic Department Report, July 1966.
2. F. M. Council and W. H. Hunter, "Implementation of Proven Technology in Making the Highway Environment Safe," University of North Carolina, Highway Safety Research Center Report, August 1975.
3. J. D. Michie and L. R. Calcote, "Location, Selection, and Maintenance of Highway Guardrails and Median Barriers," NCHRP Report 54, 1968.
4. J. D. Michie and M. E. Bronstad, "Location, Selection, and Maintenance of Highway Traffic Barriers," NCHRP Report 118, 1971.
5. H. E. Ross, Jr., T. L. Kohutek, and J. Pledger, "Guide for Selecting, Locating, and Designing Traffic Barriers. Volume I: Guidelines," Final Report, DOT Contract FH-11-8507, February 1976.

ADDENDUM

The impact speed distribution used in this report was estimated on the basis of historical data generated by Lampela and Yang (see Figure 6 and Reference 23 in Volume I, Technical Documentation), which involved approximately 1400 single-vehicle and 200 multiple-vehicle guardrail accidents in Michigan. Since the initial completion of this report, the Calspan study, involving 7,972 accidents on both freeway and non-freeway types of roads, has been reported (K. Perchonok, T. A. Ranney, A. S. Baum, D. F. Morris, and J. D. Eppich, "Methodology for Reducing the Hazardous Effects of Highway Features and Roadside Objects," CFSI Draft Report No. ZR-5564-V-1, Contract No. DOT-FH-11-8501, May 1978).

Figure 14 shows the distribution of impact speeds from these two studies. The crosshatched bars represent the Michigan results, used in this report, and the solid bars represent the Calspan results. It can be seen in the figure that significant differences exist between the two distributions. Because of this, FHWA expressed some concern that the slower Calspan speeds might affect predictions of this cost-effectiveness model. During the review, other concerns involved the assumed severity for fixed objects with no guardrail [see paragraph III(4) of this volume] and the guardrail severity level indicator, relating vehicle accelerations to occupant injury level (see Figure 9, page 51 of Volume I). It was suggested that sensitivity runs be made on the speed distribution and severity indices. Since these estimates were integral parts of the computer programs and not user specified, it was necessary to make minor program changes.

Sensitivity Analysis Results

Case 9 of Table 6, page 24 of this volume, was selected as the test case. This is a typical 2-lane rural roadway of 5000 ADT with a 6-foot shoulder and a 6-foot guardrail-to-obstacle distance. The computer output sheet for this case, taken from page C.10, is repeated in Figure 15. Since this run included the questioned no-guardrail severities of paragraph III(4), the first effort was to modify these severities. On further study of Reference 1 (page 47 of this volume), it was decided to use 0.04 fatality/0.45 injury/0.50 vehicle damage for embankments and 0.08 fatality/0.55 injury/0.50 vehicle damage for fixed objects. With these severities and the Michigan speed distribution, Figures 16, 17, and 18 show the results for severity index factors of 0.5, 1.0, and 2.0, respectively. Speed distributions from the Calspan study were next placed in the program. Figures 19, 20, and 21 show the results for the three severity index factors of 0.5, 1.0, and 2.0.

Discussion of Results

On comparing Figures 15 and 17, it can be seen that the reduction of the no-guardrail cost with the severity changes effectively reduces the benefit/cost ratios. The changes in guardrail societal costs from Figure 15 to Figure 17 were caused by the severity changes when the dynamic deflection of the guardrail exceeded the guardrail-to-obstacle distance [see paragraph III(4) on page 9]. It was felt that if a fatality had been predicted for the guardrail, it should not be reduced to 0.5 fatality/0.5 injury when the distance was exceeded. Thus, a severity of 1.0 fatality/0.0 injury/0.50 vehicle damage was used for this case. If the guardrail had not predicted a fatality, at least an injury should occur. Thus, a severity of 0.0 fatality/1.0 injury/0.50 vehicle damage was used. Note that societal costs for the stiffer guardrail types THRIE, A, C, B, and G4W were not changed by this modification. Values for the other types were reduced, notably the weak G1 system, which moved from position 11 to position 2 in the societal cost row.

On comparing Figures 16, 17, and 18 (or Figures 19, 20, and 21), it can be seen that some shifting in preference for the benefit/cost ratio row occurs. However, the most significant changes are

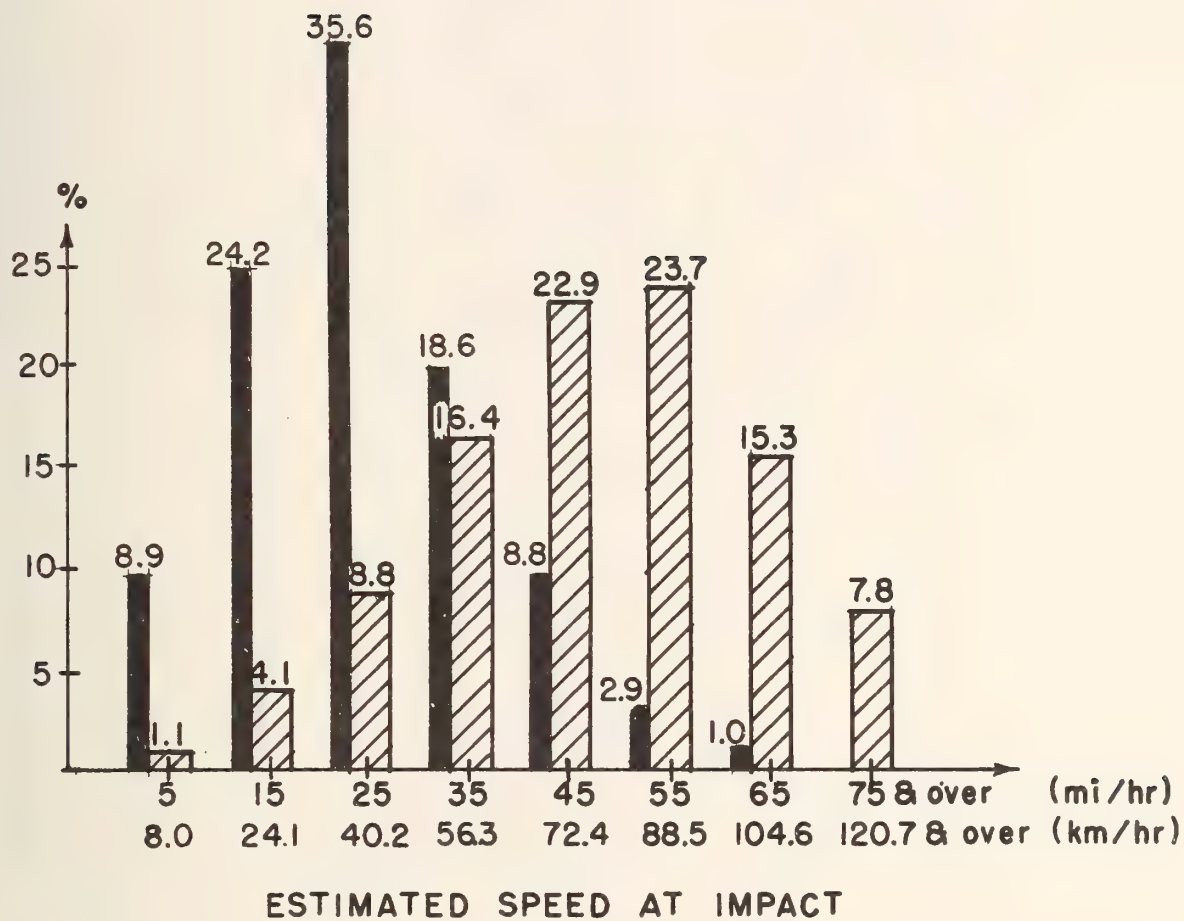


FIGURE 14. DISTRIBUTION OF VEHICLE SPEEDS

CASE 9

CASE 9. 2-LANE RURAL ROAD

SUMMARY OF RESULTS

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 8883.02
 AADT = 5000 GUARDRAIL LENGTH = 500 FT OBSTACLE LENGTH = 400 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	1392.38	2017.38	2092.38	2342.38	2892.38	2892.38	2967.38	3092.38	3092.38	3592.38	6592.38
SOCIETAL COST	G2	G4S	D	THRIE	A	E	G3	C	B	G4W	G1
VALUES	1380.73	3044.71	3208.06	3288.52	3322.59	3420.13	3668.33	3781.34	4361.55	4371.19	8095.55
TOTAL COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G1	G3
VALUES	3398.11	5414.97	6123.72	6137.09	6175.44	6312.50	6880.90	7203.93	7463.57	9487.93	10260.71
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3	G1
VALUES	3.62	2.56	2.09	1.85	1.82	1.82	1.52	1.50	1.39	.76	.42

SUMMARY OF RESULTS

SENSITIVITY STUDY WITH MICHIGAN SPEED DISTRIBUTION AND SENSITIVITY = 0.5

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 3532.00

AADT = 5000 GUARDRAIL LENGTH = 500 FT OBSTACLE LENGTH = 400 FT

DEGREE OF CURVE	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	1392.38	2017.38	2092.38	2342.38	2842.38	2892.38	2967.38	3092.38	3092.38	3592.38	6592.38
SOCIETAL COST	G2	THRIE	C	A	E	G3	D	G4S	B	G4W	G1
VALUES	862.20	906.58	1086.65	1111.80	1250.99	1256.98	1346.92	1418.20	1666.86	1676.50	2596.62
TOTAL COST	G2	A	C	G1	E	D	THRIE	B	G4S	G4W	G3
VALUES	2879.58	3204.18	3429.03	3989.00	4143.37	4314.30	4498.96	4509.24	4510.58	4768.88	7849.36
BENEFIT/COST	G2	A	C	E	D	THRIE	G4S	G1	B	G4W	G3
VALUES	1.32	1.16	1.04	.79	.74	.73	.68	.67	.66	.60	.35

FIGURE 16. MICHIGAN SPEED DISTRIBUTION WITH S.I. FACTOR = 0.5

SUMMARY OF RESULTS

SENSITIVITY STUDY WITH MICHIGAN SPEED DISTRIBUTION AND SENSITIVITY = 1.0

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT

GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT

SOCIETAL COST WITH NO GUARDRAIL = \$ 3532.00

AADT = 5000

GUARDRAIL LENGTH = 500 FT

OBSTACLE LENGTH = 400 FT

DEGREE OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	1392.38	2017.38	2092.38	2342.38	2842.38	2892.38	2967.38	3092.38	3092.38	3592.38	6592.38
SOCIETAL COST	G2	G1	G4S	D	THRIE	A	E	G3	C	B	G4W
VALUES	1348.44	3011.92	3024.62	3187.97	3288.52	3322.59	3400.03	3636.04	3781.34	4361.55	4371.19
TOTAL COST	G2	G1	A	G4S	C	D	E	THRIE	B	G4W	G3
VALUES	3365.82	4404.30	5414.97	6117.00	6123.72	6155.34	6292.41	6880.90	7203.92	7463.57	10228.42
BENEFIT/COST	G2	G1	G4S	D	A	THRIE	E	G3	C	G4W	B
VALUES	1.08	.37	.16	.12	.10	.07	.05	-.02	-.11	-.27	-.29

FIGURE 17. MICHIGAN SPEED DISTRIBUTION WITH S.I. FACTOR = 1.0

SUMMARY OF RESULTS

SENSITIVITY STUDY WITH MICHIGAN SPEED DISTRIBUTION AND SENSITIVITY = 2.0

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 3532.00

AADT = 5000 GUARDRAIL LENGTH = 500 FT OBSTACLE LENGTH = 400 FT

DEGREE OF CURVE	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	1342.38	2017.38	2042.38	2342.38	2842.38	2842.38	2967.38	3092.38	3092.38	3592.38	6592.38
SOCIETAL COST	G2	G1	G4S	E	D	C	G3	THRIE	A	B	G4W
VALUES	6354.36	6878.02	9882.68	10547.21	13582.94	15992.76	16155.46	16960.43	17165.66	20344.51	20354.15
TOTAL COST	G1	G2	G4S	E	D	C	A	THRIE	G3	B	G4W
VALUES	8270.39	8371.74	12975.05	13439.59	16550.31	18335.14	19258.03	20552.81	22747.84	23186.89	23446.53
BENEFIT/COST	G2	G3	G4S	G1	E	D	THRIE	C	G4W	B	A
VALUES	-1.40	-1.91	-2.05	-2.40	-2.43	-3.39	-3.74	-5.32	-5.44	-5.91	-6.52

FIGURE 18. MICHIGAN SPEED DISTRIBUTION WITH S.I. FACTOR = 2.0

SUMMARY OF RESULTS SENSITIVITY STUDY WITH CALSPAN SPEED DISTRIBUTION AND SENSITIVITY = 0.5

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 3532.00
 AADT = 5000 GUARDRAIL LENGTH = 500 FT OBSTACLE LENGTH = 400 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST VALUES	G1 1392.38	G2 2017.38	A 2092.38	C 2342.38	B 2842.38	E 2892.38	D 2967.38	G4W 3092.38	G4S 3092.38	THRIE 3592.38	G3 6592.38
SOCIETAL COST VALUES	THRIE 716.78	G2 753.96	C 777.21	A 899.96	D 993.49	G4S 1018.81	G3 1044.49	B 1045.10	G4W 1052.03	E 1061.89	G1 1153.50
TOTAL COST VALUES	G1 2545.88	G2 2771.34	A 2992.34	C 3119.59	B 3887.48	E 3954.26	D 3960.87	G4S 4111.19	G4W 4144.41	THRIE 4309.16	G3 7636.87
BENEFIT/COST VALUES	G1 1.71	G2 1.38	A 1.26	C 1.18	B 0.87	D 0.86	E 0.85	G4S 0.81	G4W 0.80	THRIE 0.78	G3 0.38

FIGURE 19. CALSPAN SPEED DISTRIBUTION WITH S.I. FACTOR = 0.5

SUMMARY OF RESULTS

SENSITIVITY STUDY WITH CALSPAN SPEED DISTRIBUTION AND SENSITIVITY = 1.0

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT

GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT

SOCIETAL COST WITH NO GUARDRAIL = \$ 3532.00

AADT = 5000

GUARDRAIL LENGTH = 500 FT

OBSTACLE LENGTH = 400 FT

DEGREE OF CURVE	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	1392.38	2017.38	2092.38	2342.38	2842.38	2892.38	2967.38	3092.38	3092.38	3592.38	6592.38
SOCIETAL COST	G2	G1	A	THRIE	C	D	G4S	G3	E	B	G4W
VALUES	846.53	1512.06	1755.10	2177.08	2315.04	2430.27	2445.39	2504.06	2575.99	2582.93	2589.86
TOTAL COST	G2	G1	A	C	D	B	E	G4S	G4W	THRIE	G3
VALUES	2863.91	2904.44	3847.48	4657.42	5397.65	5425.31	5468.37	5537.77	5682.24	5769.46	9096.44
BENEFIT/COST	G1	G2	A	C	THRIE	D	G4S	B	E	G4W	G3
VALUES	1.45	1.33	.85	.52	.38	.37	.35	.33	.33	.30	.16

FIGURE 20. CALSPAN SPEED DISTRIBUTION WITH S.I. FACTOR = 1.0

SUMMARY OF RESULTS

SENSITIVITY STUDY WITH CALSPAN SPEED DISTRIBUTION AND SENSITIVITY = 2.0

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 3532.00

AADT = 5000 GUARDRAIL LENGTH = 500 FT OBSTACLE LENGTH = 400 FT

DEGREE OF CURVE	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	1392.38	2017.38	2092.38	2342.38	2842.38	2892.38	2967.38	3092.38	3092.38	3592.38	6592.38
SOCIETAL COST	G2	G4S	G1	E	THRIE	A	C	D	G3	B	G4W
VALUES	3051.87	5112.91	5694.48	7544.51	7865.74	8046.92	10228.63	10306.48	10494.98	15715.41	15722.34
TOTAL COST	G2	G1	G4S	A	E	THRIE	C	D	G3	B	G4W
VALUES	5069.25	7086.86	8205.29	10141.30	10436.89	11458.12	12571.01	13273.86	17087.36	18557.79	18814.72
BENEFIT/COST	G2	G4S	G3	THRIE	E	G1	A	D	C	G4W	B
VALUES	.24	-.51	-1.06	-1.21	-1.39	-1.55	-2.16	-2.28	-2.86	-3.94	-4.29

FIGURE 21. CALSPAN SPEED DISTRIBUTION WITH S.I. FACTOR = 2.0

the reductions in benefit/cost ratios to all-negative values at the S.I. factor of 2.0. With a doubling of the guardrail severity, these results were not unexpected.

On comparing Figures 17 and 20, it can be seen that both shifting in order of preference and changes in values occur with the change from the Michigan to the Calspan speed distribution. The changes in values were not unexpected, but it was hoped that the order of preference would not change. Unfortunately, this did occur.

By far the most significant feature of this analysis is the further reduction of the no-guardrail severities, resulting in the negative benefit/cost ratios. It was pointed out in Figures 1 of the Executive Summary, Volume I, and this volume of the report that a guardrail was warranted *a priori*, as determined by standard warranting procedures. The criterion for guardrail need in such procedures has classically been that the severity of impacting the guardrail is less than that of impacting the obstacle. Thus, negative benefit/cost ratios should never occur. Unfortunately, the question of what severity to presuppose for a guardrail warrant is nebulous at best.

The severity of general accident data that includes all impacts is inconsistent with this assumption of warranting procedures that the no-guardrail condition is more severe than that of the guardrail. However, if the accident experience at a site is known and the predicted severities of the guardrails in this study can be accepted, the model might well be applicable as a warranting tool. A negative benefit/cost ratio would imply that the guardrail is not warranted and would, indeed, make the condition worse. Ratios between zero and one would indicate some improvement in the condition but not enough to warrant the cost of the guardrail. Only conditions with ratios greater than unity would warrant further consideration.

Conclusions

- The cost-effectiveness model is sensitive (order of preference as well as corresponding values) to changes in the severity index.
- The model is sensitive to the change in speed distribution.

Recommendations

- If the Michigan speed distribution is representative and the severity assumptions of the report are acceptable, the results presented herein can be applied directly.
- If the Calspan speed distribution and the severity assumptions discussed above are more acceptable, regenerated site selection tables should be obtained from FHWA for use.
- If speed distribution, severity assumptions, or other values used in generating the site selection tables are unacceptable, the revised program should be requested from FHWA and applied to generate the user's own guardrail selection aids.

APPENDIX A
SITE SELECTION TABLES

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 3 FT

2R-3-0

PAVEMENT-TO-GUARDFAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 3 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 292.86

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	G2	A	E	G3	C	B	G4W	G1
VALUES	144.93	152.31	153.78	156.03	162.52	164.77	176.58	183.87	211.93	212.39	413.90
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	559.50	581.00	652.35	692.37	743.25	745.78	763.41	780.40	830.87	872.25	1495.06
BENEFIT/COST	G2	A	G4S	D	C	E	THRIE	B	G4W	G3	G1
VALUES	.34	.31	.24	.24	.23	.22	.19	.14	.13	.09	-.43
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	G2	A	E	G3	C	B	G4W	G1
VALUES	139.37	146.48	147.74	148.42	156.07	159.18	169.34	175.94	204.71	205.17	404.05
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	549.45	574.54	644.42	682.53	737.65	741.22	757.84	773.19	823.65	866.90	1487.81
BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
VALUES	.36	.33	.25	.25	.24	.23	.20	.16	.14	.09	-.40
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	G2	A	E	G3	C	B	G4W	G1
VALUES	133.83	136.61	142.88	143.23	149.53	153.51	162.08	167.78	197.28	197.74	393.35
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	540.08	568.01	636.26	671.83	731.99	736.71	752.30	765.76	816.21	861.36	1480.56
BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
VALUES	.34	.34	.27	.26	.25	.24	.21	.17	.15	.10	-.36
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	D	A	E	G3	C	B	G4W	G1
VALUES	126.66	128.43	137.24	138.86	143.06	147.86	154.96	159.55	189.77	190.22	381.82
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	530.13	561.54	628.02	660.29	726.33	732.33	746.91	758.25	808.70	855.72	1473.44
BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
VALUES	.41	.36	.28	.27	.26	.25	.22	.18	.17	.10	-.32
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	D	A	E	G3	C	B	G4W	G1
VALUES	116.91	123.29	131.63	134.68	136.82	142.29	148.15	151.42	182.34	182.78	369.49
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	520.38	555.30	619.89	647.96	720.77	728.15	741.76	750.82	801.26	850.11	1466.62
BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
VALUES	.44	.37	.30	.27	.27	.26	.22	.19	.18	.11	-.28

A.2

A.2

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 3 FT

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT										
PAVEMENT-TO-OBSTACLE DISTANCE = 3 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 292.86										
AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT										
DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10 11
PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48 1318.48
SOCIETAL COST	G2	G4S	THRIE	D	A	E	G3	C	B	G4W G1
VALUES	107.61	118.45	126.16	130.73	130.93	136.85	141.75	143.54	175.10	175.54 356.44
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE G3
VALUES	511.08	545.40	612.02	634.92	715.33	724.20	736.92	743.58	794.01	844.63 1460.22
BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3 G1
VALUES	.46	.39	.32	.28	.27	.27	.23	.21	.19	.11 -.23
-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48 1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	E	G3	C	B	G4W G1
VALUES	98.81	113.88	120.92	125.36	126.97	131.55	135.73	135.93	168.08	168.51 342.77
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE G3
VALUES	562.28	543.84	604.40	621.24	710.02	720.44	732.36	736.56	786.98	839.30 1454.21
BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3 G1
VALUES	.48	.40	.33	.29	.28	.28	.24	.22	.20	.12 -.18
-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48 1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	E	G3	C	B	G4W G1
VALUES	90.19	105.45	115.46	119.89	123.31	126.33	128.40	129.86	161.12	161.54 328.53
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE G3
VALUES	493.67	538.37	546.87	607.00	704.81	716.79	727.92	729.54	780.01	833.94 1448.33
BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3 G1
VALUES	.50	.41	.35	.30	.29	.29	.25	.23	.21	.12 -.13
-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48 1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	E	G3	C	B	G4W G1
VALUES	81.08	104.92	109.72	114.09	119.65	120.59	121.20	123.67	153.92	154.33 313.80
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE G3
VALUES	484.56	532.57	589.06	592.28	699.67	713.13	722.39	723.40	772.81	828.20 1442.14
BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3 G1
VALUES	.52	.43	.37	.30	.30	.29	.25	.24	.22	.13 -.06
-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48 1318.48
SOCIETAL COST	G2	G4S	THRIE	A	C	D	E	G3	B	G4W G1
VALUES	70.89	100.19	103.31	107.64	112.24	115.97	116.22	116.82	146.28	146.69 298.81
TOTAL COST	G2	A	G1	C	E	D	B	G4S	G4W	THRIE G3
VALUES	474.37	526.11	577.29	580.71	694.69	709.44	714.76	718.67	765.17	821.79 1435.29
BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3 G1
VALUES	.55	.44	.39	.31	.31	.30	.26	.26	.24	.13 -.02

A.3

2R-3-0

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 3-FT SHOULDER

2R-3-2

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 5 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 710.68

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10	STATE COST	G1	G2	A	C	B	D	E	G4S	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	593.48	578.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	G3	D	C	A	E	G4S	B	G2	B	G4W	G1
	VALUES	186.69	245.47	251.95	253.37	336.05	351.32	358.82	375.05	396.50	396.96	738.15	
	TOTAL COST	C	A	G2	D	THRIE	B	E	G4S	G4W	G1	G3	
	VALUES	721.85	754.53	782.53	845.43	905.17	937.30	964.98	969.79	1015.44	1016.63	1564.45	
	BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1	
	VALUES	.98	.90	.82	.77	.73	.61	.58	.55	.51	.35	-.10	

8	STATE COST	G1	G2	A	C	B	D	E	G4S	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	593.48	578.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	G3	C	D	A	E	G4S	B	G2	B	G4W	G1
	VALUES	178.26	233.85	240.38	240.84	322.39	336.67	345.10	362.33	381.49	381.94	737.97	
	TOTAL COST	C	A	G2	D	THRIE	E	B	G4S	G4W	G1	G3	
	VALUES	708.86	740.86	765.80	834.32	896.73	923.57	949.96	955.14	1000.42	1016.45	1552.33	
	BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1	
	VALUES	1.00	.93	.86	.79	.74	.63	.60	.58	.53	.36	-.10	

A.4

6	STATE COST	G1	G2	A	C	B	D	E	G4S	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	593.48	578.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	G3	C	D	A	E	G4S	B	G2	B	G4W	G1
	VALUES	169.57	221.24	226.73	229.28	307.83	321.11	330.48	347.65	365.47	365.93	737.78	
	TOTAL COST	C	A	G2	D	THRIE	E	B	G4S	G4W	G1	G3	
	VALUES	645.21	726.31	748.12	822.75	888.05	908.46	933.45	939.58	984.40	1016.25	1539.71	
	BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1	
	VALUES	1.03	.96	.91	.81	.75	.66	.63	.61	.56	.37	-.10	

4	STATE COST	G1	G2	A	C	B	D	E	G4S	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	593.48	578.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	G3	C	D	A	E	G4S	B	G2	B	G4W	G1
	VALUES	160.77	208.40	212.69	217.47	292.57	304.82	315.12	326.25	348.67	349.12	737.57	
	TOTAL COST	C	A	G2	D	THRIE	E	B	G4S	G4W	G1	G3	
	VALUES	681.17	711.05	728.72	810.95	879.25	893.60	917.14	923.30	967.59	1016.05	1526.87	
	BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1	
	VALUES	1.06	1.00	.95	.83	.77	.68	.66	.64	.58	.38	-.10	

2	STATE COST	G1	G2	A	C	B	D	E	G4S	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	593.48	578.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	G3	C	D	A	E	G4S	B	G2	B	G4W	G1
	VALUES	152.03	195.66	198.60	205.71	276.84	288.06	299.22	307.44	331.35	331.79	737.35	
	TOTAL COST	C	A	G2	D	THRIE	E	B	G4S	G4W	G1	G3	
	VALUES	667.07	695.32	710.91	799.18	870.50	877.69	899.82	906.54	950.26	1015.83	1514.13	
	BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1	
	VALUES	1.04	1.04	1.00	.85	.78	.71	.68	.67	.61	.39	-.10	

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 3-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 5 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 710.68
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48 1318.48
SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	G2	B	G1
VALUES	143.47	183.32	184.77	194.22	260.89	271.05	282.95	288.50	313.77	314.20 737.12
TOTAL COST	C	A	G2	D	E	THRIE	B	G4S	G4W	G1
VALUES	653.24	679.36	691.98	787.69	861.43	861.95	882.24	889.52	932.68	1015.60 1501.79
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3
VALUES	1.12	1.07	1.05	.87	.79	.74	.71	.70	.64	.40 -.09
-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48 1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	G2	B	G1
VALUES	135.15	171.31	171.44	183.07	244.77	253.86	266.41	269.53	296.03	296.46 736.87
TOTAL COST	C	A	G2	D	E	THRIE	B	G4S	G4W	G1
VALUES	639.78	663.24	673.01	776.54	844.88	853.63	864.50	872.33	914.93	1015.35 1489.42
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3
VALUES	1.15	1.11	1.09	.89	.80	.77	.74	.73	.67	.41 -.09
-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48 1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	G2	B	G1
VALUES	126.90	157.89	159.64	171.95	228.22	236.77	249.43	250.21	277.86	278.28 736.60
TOTAL COST	C	A	G2	D	E	THRIE	B	G4S	G4W	G1
VALUES	626.36	646.70	653.69	765.42	827.91	845.38	866.33	854.74	896.75	1015.08 1478.12
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3
VALUES	1.18	1.15	1.14	.91	.81	.80	.77	.76	.70	.42 -.09
-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48 1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	G2	B	G1
VALUES	118.43	143.71	147.04	160.19	210.69	217.78	229.86	231.66	258.62	259.04 736.30
TOTAL COST	C	A	G2	D	E	THRIE	B	G4S	G4W	G1
VALUES	612.19	629.16	633.33	753.67	810.14	827.10	836.26	836.90	877.51	1014.78 1465.51
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3
VALUES	1.21	1.19	1.19	.93	.83	.82	.80	.80	.73	.43 -.09
-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48 1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	G2	B	G1
VALUES	109.50	128.13	132.88	147.24	191.77	198.08	207.95	212.93	237.87	238.28 735.98
TOTAL COST	C	A	G2	D	E	THRIE	B	G4S	G4W	G1
VALUES	596.61	610.24	611.43	740.71	791.40	806.35	816.56	827.98	856.75	1014.46 1451.36
BENEFIT/COST	G2	C	A	D	THRIE	E	G4S	B	G4W	G3
VALUES	1.25	1.24	1.24	.95	.86	.84	.83	.83	.76	.44 -.09

A.5

2R-3-2

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 3-FT SHOULDER

2R-3-4

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 7 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 615.45
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	G2	THRIE	A	G3	C	E	B	G4W	G1
VALUES	144.68	152.17	156.03	158.37	162.52	176.58	183.87	191.49	213.13	213.59	565.21
TOTAL COST	G2	A	C	D	G4S	E	B	G4W	G1	THRIE	G3
VALUES	559.50	581.00	652.35	745.65	763.16	769.96	781.60	832.07	843.68	876.84	1495.06
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THRIE	G3	G1
VALUES	1.14	1.08	.92	.78	.76	.73	.71	.65	.64	.33	.18
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	G2	THRIE	A	G3	C	E	B	G4W	G1
VALUES	139.14	146.48	147.61	151.81	156.07	169.34	175.94	184.16	205.57	206.03	561.53
TOTAL COST	G2	A	C	D	G4S	E	B	G4W	G1	THRIE	G3
VALUES	549.95	574.54	644.42	741.09	752.62	762.64	774.04	824.50	840.01	870.29	1487.81
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THRIE	G3	G1
VALUES	1.16	1.10	.94	.79	.77	.75	.72	.66	.65	.34	.19
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	G2	THRIE	A	G3	C	E	B	G4W	G1
VALUES	133.67	136.61	143.14	145.20	149.53	162.08	167.78	176.58	197.86	198.31	557.66
TOTAL COST	G2	A	C	D	G4S	E	B	G4W	G1	THRIE	G3
VALUES	540.08	568.01	636.26	736.61	752.15	755.06	766.34	816.79	836.14	863.67	1480.56
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THRIE	G3	G1
VALUES	1.19	1.11	.96	.80	.78	.76	.73	.67	.65	.34	.21
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	G2	THRIE	A	G3	C	E	B	G4W	G1
VALUES	126.66	128.35	138.67	138.81	143.06	154.96	159.55	168.82	190.15	190.59	553.59
TOTAL COST	G2	A	C	D	G4S	E	B	G4W	G1	THRIE	G3
VALUES	530.13	561.54	628.02	732.29	746.83	747.24	758.62	809.07	832.07	857.14	1473.44
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THRIE	G3	G1
VALUES	1.21	1.13	.97	.80	.79	.77	.75	.69	.66	.35	.22
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	G2	THRIE	A	G3	C	E	B	G4W	G1
VALUES	116.91	123.27	132.39	134.68	136.82	148.15	151.42	160.93	182.56	183.00	549.31
TOTAL COST	G2	A	C	D	G4S	E	B	G4W	G1	THRIE	G3
VALUES	520.38	555.30	619.89	728.15	739.41	741.74	751.04	801.48	827.79	850.86	1466.62
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THRIE	G3	G1
VALUES	1.24	1.14	.99	.81	.80	.79	.76	.70	.67	.35	.24

A.6

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 3-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 7 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 615.45

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
n	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
STATE COST	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
VALUES	G2	G4S	THRIE	D	A	G3	C	E	B	G4W	G1
SOCIETAL COST	107.61	118.47	126.48	130.75	130.93	141.75	143.54	153.00	175.23	175.66	544.83
VALUES	G2	A	C	D	E	G4S	B	G4W	G1	THRIE	G3
TOTAL COST	511.08	549.40	612.02	724.23	731.48	736.94	743.70	794.14	823.31	844.96	1460.22
VALUES	G2	A	C	D	G4S	E	B	G4W	THRIE	G3	G1
BENEFIT/COST	1.26	1.16	1.01	.82	.80	.80	.77	.71	.68	.36	.25

-2	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
STATE COST	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
VALUES	G2	G4S	THRIE	A	D	G3	C	E	B	G4W	G1
SOCIETAL COST	98.81	113.91	120.93	125.36	127.00	135.73	135.93	145.07	168.14	168.57	540.17
VALUES	G2	A	C	D	E	G4S	B	G4W	G1	THRIE	G3
TOTAL COST	502.28	543.84	604.40	720.47	723.55	732.39	736.62	787.04	818.65	839.40	1454.21
VALUES	G2	A	C	D	E	G4S	B	G4W	THRIE	G3	G1
BENEFIT/COST	1.28	1.17	1.02	.82	.81	.81	.79	.72	.69	.36	.27

A.7

-4	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
STATE COST	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
VALUES	G2	G4S	THRIE	A	D	C	G3	E	B	G4W	G1
SOCIETAL COST	90.19	109.47	115.48	119.89	123.33	128.40	129.86	137.20	161.14	161.56	535.38
VALUES	G2	A	C	E	D	G4S	B	G4W	G1	THRIE	G3
TOTAL COST	493.67	538.37	586.87	715.67	716.81	727.94	729.62	780.04	813.86	833.96	1448.33
VALUES	G2	A	C	D	E	G4S	B	G4W	THRIE	G3	G1
BENEFIT/COST	1.30	1.18	1.04	.83	.83	.82	.80	.73	.70	.37	.29

-6	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
STATE COST	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
VALUES	G2	G4S	THRIE	A	D	C	G3	E	B	G4W	G1
SOCIETAL COST	81.08	104.93	109.72	114.09	119.66	120.59	123.67	129.48	153.93	154.34	530.54
VALUES	G2	A	C	E	D	B	G4S	G4W	G1	THRIE	G3
TOTAL COST	484.56	532.57	589.06	707.95	713.14	722.40	723.41	772.82	809.02	828.20	1442.14
VALUES	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
BENEFIT/COST	1.32	1.20	1.06	.84	.84	.83	.81	.75	.70	.37	.30

-8	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
STATE COST	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
VALUES	G2	G4S	THRIE	A	D	C	G3	E	B	G4W	G1
SOCIETAL COST	70.89	100.19	103.31	107.64	112.24	115.97	116.82	122.11	146.28	146.69	525.76
VALUES	G2	A	C	E	D	B	G4S	G4W	G1	THRIE	G3
TOTAL COST	474.37	526.11	580.71	700.58	709.45	714.76	718.67	765.17	804.24	821.79	1435.29
VALUES	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
BENEFIT/COST	1.35	1.21	1.07	.85	.84	.83	.83	.76	.71	.38	.32

2R-3-4

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 3-FT SHOULDER

2R-3-6

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 9 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 534.10

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	C	B	G4W	G1
VALUES	72.51	144.93	152.31	153.78	164.77	166.59	176.59	179.50	207.71	208.17	382.11
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	475.98	585.06	647.98	660.58	733.25	745.78	763.41	776.18	826.65	872.25	1495.06
BENEFIT/COST	G2	A	C	D	E	G4S	B	G1	THRIE	G4W	G3
VALUES	1.14	.88	.76	.64	.64	.63	.57	.55	.53	.53	.27
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	A	E	G3	C	B	G4W	G1
VALUES	69.45	139.37	147.74	148.42	159.07	159.18	169.34	172.72	201.60	202.06	373.54
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	472.43	577.55	641.14	652.01	737.65	741.22	757.84	770.07	820.53	866.90	1487.81
BENEFIT/COST	G2	A	C	D	E	G4S	B	G1	G4W	THRIE	G3
VALUES	1.15	.90	.77	.65	.65	.64	.58	.58	.54	.54	.28
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	D	A	E	G3	C	B	G4W	G1
VALUES	66.54	133.83	142.88	143.23	151.58	153.51	162.08	165.58	195.16	195.61	364.21
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	470.02	570.06	634.06	642.69	731.99	736.71	752.30	763.63	814.09	861.36	1480.56
BENEFIT/COST	G2	A	C	D	E	G4S	G1	B	G4W	THRIE	G3
VALUES	1.16	.91	.79	.66	.66	.65	.61	.60	.55	.54	.28
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	D	A	E	G3	C	B	G4W	G1
VALUES	63.84	128.43	137.24	138.86	144.32	147.86	154.46	158.19	188.47	188.92	354.14
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	467.32	562.80	626.67	632.62	726.33	732.33	746.91	756.45	807.39	855.72	1473.44
BENEFIT/COST	G2	A	C	E	D	G4S	G1	B	G4W	THRIE	G3
VALUES	1.17	.93	.80	.67	.67	.66	.65	.61	.56	.55	.29
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	D	A	E	G3	C	B	G4W	G1
VALUES	61.40	123.29	131.63	134.68	137.49	142.29	148.15	150.70	181.65	182.09	343.37
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	464.87	555.97	619.18	621.85	720.77	728.15	741.76	750.13	800.57	850.11	1466.62
BENEFIT/COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	1.17	.95	.82	.68	.68	.67	.66	.62	.57	.56	.29

A.8

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 3-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 9 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 534.10

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	D	A	E	G3	C	B	G4W	G1
VALUES	59.23	118.45	126.16	130.73	131.22	136.85	141.75	143.23	174.81	175.24	331.96
TOTAL COST	G2	A	G1	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	462.70	549.69	610.44	611.71	715.33	724.20	736.92	743.28	793.72	844.63	1460.22
BENEFIT/COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	1.18	.96	.83	.73	.69	.68	.67	.63	.58	.57	.30

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	E	G3	C	B	G4W	G1
VALUES	57.30	113.88	120.82	125.45	126.97	131.55	135.73	135.83	167.99	168.42	319.98
TOTAL COST	G2	A	G1	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	460.77	543.93	598.46	604.31	710.02	720.44	732.36	736.46	786.89	839.30	1454.21
BENEFIT/COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	1.18	.98	.85	.77	.70	.69	.68	.64	.59	.58	.30

A.9

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	E	C	G3	B	G4W	G1
VALUES	55.53	109.45	115.46	119.91	123.31	126.33	128.38	129.86	161.10	161.52	307.47
TOTAL COST	G2	A	G1	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	459.00	538.38	585.94	596.86	704.81	716.79	727.92	729.57	780.00	833.94	1448.33
BENEFIT/COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	1.19	.99	.87	.81	.70	.69	.69	.66	.60	.58	.31

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	C	E	G3	B	G4W	G1
VALUES	53.84	104.92	109.72	114.09	119.65	120.59	121.20	123.67	153.92	154.33	294.47
TOTAL COST	G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	457.32	532.57	572.95	589.06	699.67	713.13	722.39	723.40	772.81	828.20	1442.14
BENEFIT/COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	1.19	1.00	.88	.86	.71	.70	.69	.67	.61	.59	.31

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	C	D	E	G3	B	G4W	G1
VALUES	52.21	100.19	103.31	107.64	112.24	115.97	116.22	116.82	146.28	146.69	281.17
TOTAL COST	G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	455.69	526.11	559.65	580.71	694.69	709.44	714.76	718.67	765.17	821.79	1435.29
BENEFIT/COST	G2	A	G1	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	1.19	1.02	.91	.90	.72	.70	.70	.68	.63	.60	.32

2R-3-6

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 3-FT SHOULDER

2R-3-8

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 11 FT SOCIAL COST WITH NO GUARDRAIL = \$ 464.83

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	G1	A	C	B	G4W
VALUES	71.22	140.72	147.94	153.78	160.85	164.46	166.58	175.34	179.51	208.17
TOTAL COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	442.94	474.69	585.06	647.99	735.33	741.41	759.19	826.64	872.25	1493.82
BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
VALUES	1.08	.98	.71	.61	.53	.53	.52	.45	.41	.22

8 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	G1	E	A	C	B	G4W
VALUES	68.54	136.25	144.52	148.42	155.03	156.28	159.07	168.45	172.72	202.06
TOTAL COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	433.51	472.01	577.54	641.20	734.76	738.00	754.73	820.53	866.90	1486.93
BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
VALUES	1.11	.98	.73	.62	.54	.53	.53	.46	.42	.22

A.10

6 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	G1	E	A	C	B	G4W
VALUES	65.92	131.70	141.03	142.88	145.34	151.54	151.58	161.48	165.58	195.61
TOTAL COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	423.82	469.40	570.06	634.06	730.01	734.51	750.18	814.09	861.36	1479.96
BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
VALUES	1.15	.99	.75	.64	.55	.54	.54	.47	.44	.23

4 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	D	A	E	C	B	G4W
VALUES	63.45	127.13	135.63	137.24	137.50	144.32	146.65	154.58	158.19	188.92
TOTAL COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	414.10	466.92	562.80	626.67	725.12	730.98	745.60	807.39	855.72	1473.05
BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
VALUES	1.18	.99	.77	.65	.55	.55	.55	.49	.45	.24

2 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	D	A	E	C	B	G4W
VALUES	61.16	122.59	126.16	131.63	133.96	137.49	141.65	147.92	150.70	181.65
TOTAL COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	404.64	464.64	555.97	619.18	720.12	727.44	741.07	800.57	850.11	1466.39
BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
VALUES	1.22	1.00	.78	.67	.56	.56	.55	.50	.46	.24

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 3-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 11 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 464.83

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE

1 2 3 4 5 6 7 8 9 10 11

0	STATE COST	G1	G2	A	C	B	E	D	G4S	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	D	A	E	G3	C	B	G4W
	VALUES	59.10	117.20	118.15	126.16	130.42	131.22	136.58	141.62	143.23	174.81	175.24
	TOTAL COST	G1	G2	A	C	E	D	G4S	G4S	G4W	THRIE	G3
	VALUES	395.67	462.57	549.69	611.71	715.05	723.89	736.63	743.28	793.72	844.63	1460.10
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
	VALUES	1.25	1.01	.80	.69	.57	.56	.56	.51	.47	.47	.25

-2	STATE COST	G1	G2	A	C	B	E	D	G4S	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	G3	C	B	G4W
	VALUES	57.23	108.76	113.79	120.82	125.45	126.87	131.46	135.67	135.83	167.99	168.42
	TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	387.24	460.71	543.93	604.31	709.44	720.35	732.27	736.46	786.89	839.30	1454.15
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	1.28	1.01	.81	.70	.58	.57	.57	.52	.48	.48	.25

A.11

-4	STATE COST	G1	G2	A	C	B	E	D	G4S	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	G3	C	B	G4W
	VALUES	55.50	100.55	104.43	115.46	119.91	123.29	126.32	128.38	129.83	161.10	161.52
	TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	379.02	458.98	538.38	586.86	704.79	716.77	727.90	729.57	780.00	833.94	1448.31
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	1.31	1.01	.82	.72	.59	.58	.57	.53	.49	.49	.25

-6	STATE COST	G1	G2	A	C	B	E	D	G4S	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	G3	C	B	G4W
	VALUES	53.83	91.86	104.92	109.72	114.09	119.65	120.59	121.20	123.66	153.92	154.33
	TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	370.34	457.31	532.57	589.06	699.67	713.12	722.39	723.40	772.81	828.20	1442.13
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	1.34	1.02	.84	.73	.59	.58	.58	.55	.50	.49	.26

-8	STATE COST	G1	G2	A	C	B	E	D	G4S	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	G3	C	B	G4W
	VALUES	52.21	82.12	100.19	103.31	107.64	112.24	115.97	116.22	116.81	146.28	146.69
	TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	360.59	455.69	526.11	580.71	694.69	709.44	714.76	718.67	765.17	821.79	1435.29
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	1.37	1.02	.85	.75	.60	.59	.59	.56	.51	.50	.26

2R-3-8

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 3-FT SHOULDER

2R-3-10

PAVEMENT-10-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-10-OBSTACLE DISTANCE = 10 FT

PAVEMENT-10-OBSTACLE DISTANCE = 13 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 406.01

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10 STATE COST	G1	G2	A	C	B	D	G4S	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	C	B	G4W
VALUES	66.62	109.16	140.71	147.93	153.78	160.85	166.58	175.34	207.51	208.17
TOTAL COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	387.64	470.10	585.06	647.99	739.33	741.41	759.19	776.18	826.64	1493.82
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W
VALUES	1.07	.84	.57	.48	.43	.43	.42	.35	.32	.17

8 STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	C	B	G4W
VALUES	65.14	104.20	136.25	144.52	148.42	156.28	159.07	168.45	172.72	202.06
TOTAL COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	382.67	468.62	577.54	641.20	734.76	737.99	754.73	770.07	820.53	1486.93
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	G4W	G3
VALUES	1.08	.84	.59	.50	.44	.44	.43	.36	.33	.18

A.12

6 STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	C	B	G4W
VALUES	63.61	99.23	131.70	141.03	142.88	151.54	151.58	161.48	165.58	195.61
TOTAL COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	377.71	467.08	570.06	634.06	730.01	734.51	750.18	763.63	814.09	1479.96
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	G4W	G3
VALUES	1.10	.85	.61	.51	.45	.44	.44	.37	.34	.19

4 STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	C	B	G4W
VALUES	62.02	94.35	127.13	137.24	137.50	144.32	146.65	154.58	158.19	188.92
TOTAL COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	372.83	465.50	562.80	626.67	725.12	730.98	745.60	756.95	807.39	1473.05
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	G4W	G3
VALUES	1.12	.85	.63	.53	.45	.45	.45	.38	.35	.19

2 STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	C	B	G4W
VALUES	60.41	89.63	122.59	131.63	133.96	137.49	141.65	147.92	150.70	181.65
TOTAL COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	368.11	463.88	555.97	619.18	720.12	727.44	741.07	750.13	800.57	1466.39
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	G4W	G3
VALUES	1.14	.86	.64	.54	.46	.46	.46	.39	.38	.20

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 3-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 13 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 406.01

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
0	STATE COST	G1	G2	A	B	E	D	G4W	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48
SOCIETAL COST	G1	G4S	G4S	THRIE	D	A	E	G3	C	B
VALUES	58.77	85.13	118.15	126.16	130.42	131.22	136.58	141.62	143.23	174.81
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE
VALUES	363.61	462.25	549.69	611.71	715.05	723.89	736.63	743.28	793.72	844.63
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W
VALUES	1.15	.86	.66	.56	.47	.47	.46	.41	.39	.37

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
-2	STATE COST	G1	G2	A	B	E	D	G4W	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48
SOCIETAL COST	G1	G4S	G4S	THRIE	A	D	E	G3	C	B
VALUES	57.13	80.85	113.79	120.82	125.45	126.87	131.46	135.67	135.83	167.99
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE
VALUES	359.33	460.61	543.93	604.31	709.94	720.35	732.27	736.46	786.89	839.30
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W
VALUES	1.17	.86	.67	.58	.47	.47	.47	.42	.40	.38

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
-4	STATE COST	G1	G2	A	B	E	D	G4W	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48
SOCIETAL COST	G1	G4S	G4S	THRIE	A	D	E	C	G3	B
VALUES	55.48	76.78	109.43	115.46	119.91	123.29	126.32	128.38	129.83	161.10
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE
VALUES	355.26	458.96	538.38	596.86	704.79	716.77	727.90	729.57	780.00	833.94
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W
VALUES	1.18	.87	.68	.59	.48	.48	.48	.43	.40	.40

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
-6	STATE COST	G1	G2	A	B	E	D	G4W	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48
SOCIETAL COST	G1	G4S	G4S	THRIE	A	D	C	E	G3	B
VALUES	53.83	72.92	104.92	109.72	114.09	119.65	120.59	121.20	123.66	153.92
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE
VALUES	351.40	457.31	532.57	589.06	699.67	713.12	722.39	723.40	772.81	828.20
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W
VALUES	1.20	.87	.70	.61	.49	.49	.48	.44	.41	.41

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
-8	STATE COST	G1	G2	A	B	E	D	G4W	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48
SOCIETAL COST	G1	G4S	G4S	THRIE	A	C	D	E	G3	B
VALUES	52.21	69.35	100.19	103.31	107.64	112.24	115.97	116.22	116.81	146.28
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE
VALUES	347.83	455.69	526.11	580.71	694.69	709.44	714.76	718.67	765.17	821.79
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W
VALUES	1.21	.88	.71	.63	.50	.49	.49	.46	.42	.42

2R-3-10

2R-3-12

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 3-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 15 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 356.18
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	66.62	73.71	140.71	147.93	153.78	160.85	166.58	170.89	179.51	207.70	208.17
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	352.18	470.10	558.06	647.99	739.33	741.41	759.19	776.18	826.64	872.25	1489.37
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	1.01	.72	.45	.38	.35	.35	.34	.28	.26	.24	.14
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	65.14	71.36	136.25	144.52	148.42	156.28	159.07	165.17	172.72	201.60	202.06
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	349.83	468.62	577.54	641.20	734.76	737.99	754.73	770.07	820.53	866.90	1483.65
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	1.02	.72	.47	.39	.36	.36	.35	.29	.27	.25	.14
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	63.61	69.24	131.70	141.03	142.88	151.54	151.58	159.24	165.58	195.16	195.61
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	347.71	467.08	570.06	634.06	730.01	734.51	750.18	763.63	814.09	861.36	1477.72
BENEFIT/COST	G1	G2	A	C	G4S	D	E	THRIE	B	G4W	G3
VALUES	1.03	.73	.49	.41	.36	.36	.35	.30	.28	.26	.15
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	62.02	67.41	127.13	137.24	137.50	144.32	146.65	153.20	158.14	188.47	188.92
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	345.88	465.50	562.80	626.67	725.12	730.48	745.60	756.95	807.39	855.72	1471.68
BENEFIT/COST	G1	G2	A	C	G4S	D	E	THRIE	B	G4W	G3
VALUES	1.04	.73	.51	.42	.37	.37	.36	.30	.30	.27	.15
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	60.41	65.90	122.59	131.63	133.96	137.44	141.65	147.19	150.70	181.65	182.09
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	344.38	463.88	555.97	619.18	720.12	727.44	741.07	750.13	800.57	850.11	1465.66
BENEFIT/COST	G1	G2	A	C	G4S	D	E	THRIE	B	G4W	G3
VALUES	1.04	.73	.52	.44	.38	.37	.37	.31	.31	.28	.16

A.14

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 3-FT SHOULDER

2R-3-12

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 15 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 356.18

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	D	A	E	G3	C	B	G4W
	VALUES	58.77	64.73	118.15	126.16	130.42	131.22	136.58	141.31	143.23	174.81	175.24
	TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	343.20	462.25	536.63	611.71	715.05	723.84	736.63	743.28	743.72	844.63	1454.78
	BENEFIT/COST	G1	G2	A	C	G4S	D	E	THRIE	B	G4W	G3
	VALUES	1.05	.74	.54	.45	.38	.38	.38	.32	.32	.29	.16

-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	G3	C	B	G4W
	VALUES	57.13	63.83	113.74	120.82	125.45	126.87	131.46	135.58	135.83	167.49	168.42
	TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	342.31	460.61	532.93	604.31	709.94	720.35	732.27	736.46	786.89	834.30	1454.05
	BENEFIT/COST	G1	G2	A	C	G4S	E	D	B	THRIE	G4W	G3
	VALUES	1.05	.74	.55	.47	.39	.39	.39	.33	.33	.30	.17

A.15

-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	C	G3	B	G4W
	VALUES	55.48	63.13	109.43	115.46	119.91	123.29	126.32	128.38	129.81	161.10	161.52
	TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	341.60	458.96	538.38	596.86	704.79	716.77	727.90	729.57	780.00	833.94	1448.29
	BENEFIT/COST	G1	G2	A	C	G4S	E	D	B	THRIE	G4W	G3
	VALUES	1.05	.75	.56	.49	.40	.40	.39	.34	.34	.31	.17

-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	A	D	C	E	G3	B	G4W
	VALUES	53.83	62.51	104.92	109.72	114.09	119.65	120.59	121.20	123.66	153.92	154.33
	TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	340.99	457.31	532.57	589.06	694.67	713.12	722.39	723.40	772.81	828.20	1442.13
	BENEFIT/COST	G1	G2	A	C	G4S	E	D	B	THRIE	G4W	G3
	VALUES	1.05	.75	.58	.50	.41	.41	.40	.36	.34	.33	.18

-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	A	C	D	E	G3	B	G4W
	VALUES	52.21	61.95	100.19	103.31	107.64	112.24	115.97	116.22	116.81	146.28	146.69
	TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	340.42	455.69	526.11	580.71	694.69	709.44	714.76	718.67	765.17	821.79	1435.29
	BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
	VALUES	1.06	.75	.59	.52	.41	.41	.40	.37	.35	.34	.18

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 4 FT

2R-4-0

PAVEMENT-T0-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-T0-OBSTACLE DISTANCE = 0 FT

PAVEMENT-T0-OBSTACLE DISTANCE = 4 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 272.31

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	G2	A	E	G3	C	R	G4W	G1
VALUES	147.40	152.37	157.14	162.08	164.53	165.12	180.61	188.27	213.09	213.53	410.57
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	565.55	583.00	656.74	689.05	743.60	745.85	765.88	781.56	832.01	875.62	1449.08
BENEFIT/COST	G2	A	D	G4S	E	C	THRIE	B	G4W	G3	G1
VALUES	.27	.26	.20	.20	.19	.18	.16	.10	.10	.07	-.50

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	G2	A	E	G3	C	R	G4W	G1
VALUES	142.13	148.05	152.20	152.96	158.51	159.87	173.66	180.86	206.37	206.81	402.63
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	556.44	576.44	644.33	681.11	738.34	741.52	760.60	774.84	825.24	870.67	1442.14
BENEFIT/COST	G2	A	G4S	D	C	E	THRIE	B	G4W	G3	G1
VALUES	.30	.27	.21	.21	.20	.19	.17	.12	.11	.07	-.47

A.16

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	G2	A	E	G3	C	R	G4W	G1
VALUES	136.76	143.16	143.71	146.87	152.19	154.50	166.47	173.00	199.25	199.69	393.81
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	546.64	570.67	641.47	672.28	732.98	737.19	755.24	767.73	818.16	865.34	1484.95
BENEFIT/COST	G2	A	G4S	D	C	E	THRIE	B	G4W	G3	G1
VALUES	.32	.29	.22	.22	.21	.20	.17	.13	.12	.08	-.44

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	G2	A	E	G3	C	R	G4W	G1
VALUES	131.40	132.80	139.44	141.19	145.66	149.11	159.14	164.78	191.82	192.25	384.03
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	536.28	564.14	633.26	662.51	727.58	732.92	749.87	760.29	810.72	859.66	1477.61
BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
VALUES	.35	.30	.23	.23	.22	.21	.18	.14	.13	.09	-.40

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	D	A	E	G3	C	B	G4W	G1
VALUES	122.11	126.14	135.26	135.31	139.07	143.74	151.81	156.36	184.19	184.61	373.27
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	525.59	557.55	624.84	651.74	722.22	728.78	744.62	752.67	803.09	853.73	1470.29
BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
VALUES	.37	.32	.25	.24	.23	.22	.19	.16	.14	.09	-.36

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 4 FT

2R-4-0

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 4 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 272.31

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	D	A	E	G3	C	B	G4W	G1
VALUES	111.44	121.09	129.22	131.35	132.61	138.45	144.68	147.92	176.53	176.95	361.51
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	514.92	551.08	616.40	639.98	716.92	724.82	739.56	745.01	795.42	847.70	1463.15
BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
VALUES	.40	.33	.27	.24	.24	.23	.20	.17	.15	.10	-.32
-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	E	G3	C	B	G4W	G1
VALUES	101.16	116.27	123.23	126.40	127.55	133.22	137.87	139.64	168.98	169.39	348.77
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	504.64	544.98	608.12	627.25	711.70	721.03	734.74	737.45	787.86	841.70	1456.34
BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
VALUES	.42	.35	.28	.25	.24	.24	.21	.18	.17	.10	-.27
-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	E	G3	C	B	G4W	G1
VALUES	91.43	111.60	117.33	120.45	123.82	127.49	131.37	131.54	161.55	161.95	335.08
TOTAL COST	G2	A	C	G1	E	D	B	G4S	G4W	THRIE	G3
VALUES	494.90	538.93	600.02	613.56	706.46	717.29	730.02	730.07	780.43	835.80	1449.84
BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
VALUES	.45	.36	.30	.26	.25	.25	.22	.19	.18	.11	-.23
-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	E	C	G3	B	G4W	G1
VALUES	81.88	106.86	111.30	114.46	120.00	122.67	123.38	124.85	154.04	154.43	320.38
TOTAL COST	G2	A	C	G1	E	D	B	G4S	G4W	THRIE	G3
VALUES	485.36	532.94	591.86	598.85	701.14	713.47	722.51	725.34	772.91	829.78	1443.33
BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
VALUES	.47	.38	.32	.27	.26	.26	.22	.21	.19	.11	-.17
-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	C	D	E	G3	B	G4W	G1
VALUES	71.70	101.81	104.69	107.91	114.70	115.97	117.24	117.78	146.06	146.45	304.61
TOTAL COST	G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	475.17	526.38	583.09	583.17	695.71	709.44	714.54	720.29	764.93	823.17	1436.25
BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
VALUES	.50	.34	.34	.28	.27	.26	.23	.22	.20	.12	-.12

A.17

2R-4-2

SUMMARY OF RESULTS 2-LANE RURAL ROAD WITH 4-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 6 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 661.21

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
10	STATE COST	G1	G2	A	C	B	E	D	G4S	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	1318.48
SOCIETAL COST	THRIE	G3	D	C	A	G4S	E	G2	B	G1
VALUES	191.44	255.07	259.26	263.10	335.36	363.06	368.31	400.44	406.42	687.40
TOTAL COST	C	A	G2	D	THRIE	E	G1	B	G4S	G3
VALUES	731.57	763.83	803.91	852.74	909.92	946.79	965.88	974.90	981.53	1573.55
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G1
VALUES	.85	.75	.68	.65	.65	.51	.48	.45	.41	-.04

8	STATE COST	G1	G2	A	C	B	E	D	G4S	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	1318.48
SOCIETAL COST	THRIE	G3	D	C	A	G4S	E	G2	B	G1
VALUES	183.47	243.68	248.86	250.98	333.75	350.42	356.59	385.52	393.46	687.29
TOTAL COST	C	A	G2	D	THRIE	E	B	G1	G4S	G3
VALUES	719.46	752.23	788.99	842.33	901.94	935.06	961.93	965.76	968.89	1562.16
BENEFIT/COST	C	A	D	G2	THRIE	E	G4S	B	G4W	G1
VALUES	.88	.78	.69	.68	.66	.53	.50	.47	.43	-.09

A.18

6	STATE COST	G1	G2	A	C	B	E	D	G4S	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	1318.48
SOCIETAL COST	THRIE	G3	D	C	A	G4S	E	G2	B	G1
VALUES	175.05	231.32	237.62	237.76	320.89	336.54	343.70	369.17	379.09	687.17
TOTAL COST	C	A	G2	D	THRIE	E	B	G1	G4S	G3
VALUES	706.23	739.36	772.64	831.10	893.53	922.18	947.57	955.01	965.65	1549.79
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G1
VALUES	.90	.81	.72	.71	.68	.55	.52	.50	.46	-.09

4	STATE COST	G1	G2	A	C	B	E	D	G4S	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	1318.48
SOCIETAL COST	THRIE	G3	D	C	A	G4S	E	G2	B	G1
VALUES	166.27	218.09	223.52	225.65	306.81	321.45	329.68	351.45	363.36	687.05
TOTAL COST	C	A	G2	D	THRIE	E	B	G1	G4S	G3
VALUES	692.00	725.28	754.93	819.13	884.75	908.16	931.84	939.92	965.52	1536.57
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G1
VALUES	.93	.85	.77	.73	.69	.57	.55	.52	.48	-.09

2	STATE COST	G1	G2	A	C	B	E	D	G4S	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	1318.48
SOCIETAL COST	THRIE	G3	D	C	A	G4S	E	G2	B	G1
VALUES	157.25	204.28	208.53	213.16	291.65	305.30	314.62	332.58	346.43	686.92
TOTAL COST	C	A	G2	D	THRIE	E	B	G1	G4S	G3
VALUES	677.00	710.13	736.05	806.63	875.72	893.10	919.91	923.78	965.33	1522.75
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G1
VALUES	.97	.88	.81	.75	.70	.60	.58	.55	.51	-.09

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 4-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 6 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 661.21

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	G2	B	G4W	G1	
	VALUES	148.16	190.27	193.19	200.46	275.68	288.34	288.71	312.86	328.60	329.02	686.79	
	TOTAL COST	C	A	G2	D	THRIE	E	B	G4S	G4W	G1	G3	
	VALUES	661.67	694.16	716.34	793.94	866.63	877.19	897.08	906.82	947.50	965.26	1508.75	
	BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1	
	VALUES	1.00	.92	.86	.78	.71	.63	.60	.59	.54	.36	-.09	

-2	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	G2	B	G4W	G1
	VALUES	139.18	176.54	177.99	187.93	259.18	270.83	282.16	292.69	310.21	310.62	686.65
	TOTAL COST	C	A	G2	D	THRIE	E	B	G4S	G4W	G1	G3
	VALUES	646.47	677.65	696.17	781.41	857.65	860.63	878.69	889.30	929.10	965.12	1495.01
	BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
	VALUES	1.03	.96	.91	.80	.73	.66	.63	.62	.57	.37	-.09

A.19

-4	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	G2	B	G4W	G1
	VALUES	130.36	163.17	163.29	175.72	242.23	252.85	265.01	272.20	291.41	291.81	686.50
	TOTAL COST	C	A	G2	D	THRIE	E	B	G4S	G4W	G1	G3
	VALUES	631.64	660.70	675.67	769.20	843.48	848.94	859.88	871.32	910.29	964.97	1481.76
	BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
	VALUES	1.06	1.00	.96	.82	.74	.68	.66	.65	.60	.38	-.09

-6	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	G2	B	G4W	G1
	VALUES	121.51	148.33	150.05	163.48	224.42	234.03	246.97	250.92	271.77	272.17	686.33
	TOTAL COST	C	A	G2	D	THRIE	E	B	G4S	G4W	G1	G3
	VALUES	616.81	642.90	654.40	756.95	825.44	839.98	890.25	852.50	890.65	964.81	1468.53
	BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
	VALUES	1.09	1.04	1.02	.84	.75	.72	.69	.69	.63	.39	-.09

-8	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	G2	B	G4W	G1
	VALUES	112.22	132.48	135.74	150.34	204.92	213.61	227.46	227.86	250.39	250.78	686.15
	TOTAL COST	C	A	G2	D	THRIE	E	B	G4S	G4W	G1	G3
	VALUES	600.96	623.39	631.34	743.82	805.94	818.87	830.69	832.09	864.26	964.63	1454.21
	BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
	VALUES	1.13	1.09	1.07	.86	.76	.75	.72	.72	.66	.40	-.09

2R-4-2

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 4-FT SHOULDER

2R-4-4

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 8 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 573.15

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	G2	THRIE	A	G3	C	E	B	G4W	G1
VALUES	147.42	152.52	162.08	162.39	164.53	180.61	188.27	192.50	214.76	215.21	545.25
TOTAL COST	G2	A	C	D	G4S	E	B	G1	G4W	THRIE	G3
VALUES	565.55	583.00	656.74	745.99	765.90	770.97	783.24	823.73	833.68	880.86	1499.08
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THRIE	G3	G1
VALUES	1.02	.98	.82	.71	.69	.66	.63	.58	.57	.30	.10
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	G2	THRIE	A	G3	C	E	B	G4W	G1
VALUES	142.10	148.12	152.96	156.19	158.51	173.66	180.86	185.61	207.60	208.04	541.74
TOTAL COST	G2	A	C	D	G4S	E	B	G1	G4W	THRIE	G3
VALUES	556.44	576.99	649.33	741.59	760.57	764.08	776.07	820.22	826.52	874.67	1492.14
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THRIE	G3	G1
VALUES	1.04	.99	.84	.72	.70	.67	.64	.59	.58	.30	.11
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	G2	THRIE	A	G3	C	E	B	G4W	G1
VALUES	136.73	143.16	143.75	149.70	152.19	166.47	173.00	178.48	200.12	200.55	538.01
TOTAL COST	G2	A	C	D	G4S	E	B	G1	G4W	THRIE	G3
VALUES	546.64	570.67	641.47	737.23	755.21	756.95	768.59	816.49	819.03	868.18	1484.95
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THRIE	G3	G1
VALUES	1.07	1.01	.85	.72	.71	.68	.66	.60	.59	.31	.13
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	G2	THRIE	A	G3	C	E	B	G4W	G1
VALUES	131.40	132.80	139.49	143.01	145.66	159.14	164.78	171.14	192.39	192.83	534.05
TOTAL COST	G2	A	C	D	E	G4S	B	G1	G1	THRIE	G3
VALUES	536.28	564.14	633.26	732.97	749.61	749.88	760.87	811.30	812.52	861.49	1477.61
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THRIE	G3	G1
VALUES	1.09	1.02	.87	.73	.71	.69	.67	.61	.60	.31	.14
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	A	G3	C	E	B	G4W	G1
VALUES	122.11	126.18	135.37	136.29	139.07	151.81	156.36	163.63	184.55	184.98	529.82
TOTAL COST	G2	A	C	D	E	G4S	B	G1	G1	THRIE	G3
VALUES	525.59	557.55	624.84	728.85	742.11	744.66	753.03	803.45	808.30	854.76	1470.29
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THRIE	G3	G1
VALUES	1.12	1.04	.89	.74	.72	.71	.68	.63	.61	.32	.16

A.20

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 4-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 8 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 573.15

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G+W	G+S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G+S	THRIE	D	A	G3	C	E	B	G+W	G1
VALUES	111.44	121.15	129.70	131.42	132.61	144.68	147.92	155.99	176.74	177.16	525.30
TOTAL COST	G2	A	C	D	E	G+S	B	G+W	G1	THRIE	G3
VALUES	514.92	551.08	616.40	724.90	734.46	739.63	745.21	795.63	803.78	848.17	1463.15
BENEFIT/COST	G2	A	C	D	G+S	E	B	G+W	THRIE	G3	G1
VALUES	1.14	1.05	.91	.74	.73	.72	.70	.64	.62	.32	.17
-2 STATE COST	G1	G2	A	C	B	E	D	G+W	G+S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G+S	THRIE	A	D	G3	C	E	B	G+W	G1
VALUES	101.16	116.33	123.39	126.40	127.61	137.87	139.64	148.23	169.09	169.50	520.49
TOTAL COST	G2	A	C	D	E	G+S	B	G+W	G1	THRIE	G3
VALUES	504.64	544.88	608.12	721.04	726.71	734.80	737.56	787.97	793.96	841.87	1456.34
BENEFIT/COST	G2	A	C	D	G+S	E	B	G+W	THRIE	G3	G1
VALUES	1.17	1.07	.93	.75	.74	.73	.71	.65	.63	.33	.19
-4 STATE COST	G1	G2	A	C	B	E	D	G+W	G+S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G+S	THRIE	A	D	G3	C	E	B	G+W	G1
VALUES	91.43	111.64	117.36	120.45	123.86	131.37	131.54	140.35	161.60	162.01	515.36
TOTAL COST	G2	A	C	D	E	B	G+S	G+W	G1	THRIE	G3
VALUES	494.90	538.93	600.02	717.33	718.83	730.07	730.11	780.48	793.84	835.84	1449.84
BENEFIT/COST	G2	A	C	D	E	G+S	B	G+W	THRIE	G3	G1
VALUES	1.19	1.08	.94	.76	.75	.75	.72	.66	.63	.34	.21
-6 STATE COST	G1	G2	A	C	B	E	D	G+W	G+S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G+S	THRIE	A	D	C	G3	E	B	G+W	G1
VALUES	81.88	106.88	111.30	114.46	120.02	123.38	124.85	132.37	154.06	154.46	509.95
TOTAL COST	G2	A	C	E	D	B	G+S	G+W	G1	THRIE	G3
VALUES	485.36	532.94	591.86	710.85	713.49	722.53	725.36	772.93	788.42	829.78	1443.33
BENEFIT/COST	G2	A	C	D	E	G+S	B	G+W	THRIE	G3	G1
VALUES	1.22	1.10	.96	.76	.76	.75	.74	.68	.64	.34	.23
-8 STATE COST	G1	G2	A	C	B	E	D	G+W	G+S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G+S	THRIE	A	C	D	G3	E	B	G+W	G1
VALUES	71.70	101.82	104.69	107.91	114.70	115.97	117.78	124.40	146.07	146.46	504.30
TOTAL COST	G2	A	C	E	D	B	G+S	G+W	G1	THRIE	G3
VALUES	475.17	526.38	593.17	702.87	709.45	714.54	720.29	764.94	782.77	823.17	1436.25
BENEFIT/COST	G2	A	C	E	D	G+S	B	G+W	THRIE	G3	G1
VALUES	1.24	1.11	.98	.78	.77	.76	.75	.69	.65	.35	.25

A.21

2R-4-4

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 4-FT SHOULDER

2R-4-6

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 10 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 498.06

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA											
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	C	B	G4W	G1
VALUES	71.90	147.40	152.37	157.14	165.12	169.18	180.61	183.27	208.26	208.71	377.90
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	475.38	587.66	651.75	656.38	743.60	745.85	765.88	776.74	827.19	875.62	1499.09
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1	G3
VALUES	1.06	.79	.67	.58	.58	.57	.51	.47	.47	.43	.24
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	C	B	G4W	G1
VALUES	68.83	142.13	148.05	152.20	159.87	162.06	173.66	177.05	202.70	203.14	371.12
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	472.30	580.53	645.53	649.60	738.34	741.52	760.60	771.17	821.61	870.67	1492.14
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1	G3
VALUES	1.06	.80	.69	.59	.58	.58	.52	.48	.48	.46	.25
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	C	B	G4W	G1
VALUES	65.86	136.76	143.71	146.87	154.50	154.70	166.47	170.30	196.65	197.08	363.54
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	469.34	573.18	638.28	642.02	732.98	737.19	755.24	765.12	815.56	865.34	1484.95
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1	G3
VALUES	1.07	.82	.70	.60	.59	.58	.53	.49	.49	.48	.25
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	C	B	G4W	G1
VALUES	63.08	131.40	139.44	141.19	147.28	149.11	159.14	163.05	190.14	190.57	355.10
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	466.56	565.76	631.52	633.58	727.58	732.92	749.87	758.62	809.05	859.66	1477.61
BENEFIT/COST	G2	A	C	D	E	G4S	B	G1	G4W	THRIE	G3
VALUES	1.08	.84	.72	.60	.60	.59	.54	.51	.50	.50	.26
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	C	B	G4W	G1
VALUES	60.53	126.14	135.26	135.31	139.99	143.74	151.81	155.38	183.25	183.67	345.77
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	464.01	558.46	623.86	624.24	722.22	728.78	744.62	751.72	802.15	853.73	1470.29
BENEFIT/COST	G2	A	C	E	D	G4S	B	G1	G4W	THRIE	G3
VALUES	1.08	.86	.73	.61	.61	.60	.55	.55	.51	.50	.26

A.22

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 4-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 10 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 498.06

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	D	A	E	G3	C	B	G4W	G1
	VALUES	58.26	121.09	129.22	131.35	133.03	138.45	144.68	147.47	176.09	176.51	335.52
	TOTAL COST	G2	A	G1	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	461.73	551.50	614.00	615.95	716.92	724.82	739.56	744.57	794.99	847.70	1463.15
	BENEFIT/COST	G2	A	C	E	D	G4S	G1	B	G4W	THRIE	G3
	VALUES	1.09	.87	.75	.62	.62	.61	.58	.57	.52	.51	.27

-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	A	D	E	G3	C	B	G4W	G1
	VALUES	56.24	116.27	123.23	126.55	127.55	133.22	137.87	139.48	168.82	169.24	324.38
	TOTAL COST	G2	A	G1	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	459.72	545.02	602.86	607.96	711.70	721.03	734.74	737.30	787.71	841.70	1456.34
	BENEFIT/COST	G2	A	C	E	D	G1	G4S	B	G4W	THRIE	G3
	VALUES	1.10	.89	.77	.63	.62	.62	.62	.58	.53	.52	.27

A.23

-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	A	D	E	G3	C	B	G4W	G1
	VALUES	54.41	111.60	117.33	120.49	123.82	127.99	131.37	131.51	161.51	161.92	312.35
	TOTAL COST	G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	457.89	538.96	540.82	594.98	706.46	717.29	729.99	730.07	780.40	835.80	1449.84
	BENEFIT/COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
	VALUES	1.10	.90	.78	.67	.64	.63	.62	.59	.54	.53	.28

-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	A	D	E	C	G3	B	G4W	G1
	VALUES	52.67	106.86	111.30	114.46	120.00	122.67	123.38	124.85	154.03	154.43	299.33
	TOTAL COST	G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	456.14	532.94	577.81	591.85	701.14	713.47	722.51	725.34	772.91	829.78	1443.33
	BENEFIT/COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
	VALUES	1.10	.92	.80	.71	.65	.64	.63	.61	.56	.54	.28

-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	A	C	D	E	G3	B	G4W	G1
	VALUES	50.93	101.81	104.69	107.91	114.70	115.97	117.24	117.28	146.06	146.45	285.24
	TOTAL COST	G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	454.40	526.38	563.72	583.17	695.71	709.44	714.54	720.29	764.93	823.17	1436.25
	BENEFIT/COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
	VALUES	1.11	.93	.82	.76	.66	.64	.64	.62	.57	.55	.29

2R-4-6

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 4-FT SHOULDER

2R-4-8

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 434.21

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G1	G3	B	G4W
VALUES	70.10	142.58	147.37	157.14	160.63	169.17	169.98	178.88	208.25	208.70
TOTAL COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	448.46	473.58	587.84	651.76	739.11	740.85	761.05	776.73	827.17	1497.35
BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
VALUES	.95	.90	.63	.54	.48	.47	.47	.40	.36	.19

8 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	G1	A	G3	B	G4W
VALUES	67.51	138.46	144.24	152.20	156.45	160.87	162.05	172.39	202.64	203.13
TOTAL COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	439.35	470.98	580.53	645.53	734.93	737.72	756.93	771.17	821.61	1490.87
BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
VALUES	.98	.91	.65	.55	.49	.48	.48	.41	.37	.20

A.24

6 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	G1	E	A	G3	B	G4W
VALUES	64.94	134.16	141.02	146.87	151.14	152.09	154.70	165.58	170.30	196.65
TOTAL COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	429.62	468.41	573.18	638.78	730.56	734.49	752.63	765.12	815.56	1484.05
BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
VALUES	1.02	.92	.67	.56	.49	.49	.49	.42	.38	.20

4 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	G1	THRIE	A	E	G3	B	G4W
VALUES	62.46	129.72	137.71	140.91	141.14	147.28	147.55	158.54	163.05	190.14
TOTAL COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	419.38	465.94	565.76	631.52	726.03	731.18	748.20	758.61	809.05	1477.02
BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
VALUES	1.05	.92	.69	.58	.50	.50	.49	.43	.39	.21

2 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	G1	D	THRIE	A	E	G3	B	G4W
VALUES	60.14	125.20	130.41	134.33	135.26	139.98	142.87	151.44	155.38	183.67
TOTAL COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	408.89	463.62	558.46	623.86	721.34	727.80	743.67	751.72	802.15	1469.92
BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
VALUES	1.09	.93	.70	.60	.51	.50	.50	.44	.41	.21

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 4-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 434.21

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	D	A	E	G3	C	B	G4W
VALUES	58.03	120.00	120.65	129.22	130.89	133.03	138.04	144.46	147.47	176.09	176.51
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	398.48	461.51	551.50	615.95	716.52	724.37	739.13	744.57	794.94	894.70	1462.94
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	1.13	.93	.72	.61	.51	.51	.51	.45	.42	.42	.22
-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	G3	C	B	G4W
VALUES	56.12	110.02	116.12	123.23	126.55	127.39	133.08	137.75	139.48	168.82	169.24
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	388.50	459.60	545.02	607.96	711.55	720.87	734.54	737.30	787.71	841.70	1456.23
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	1.16	.94	.74	.63	.52	.52	.51	.47	.43	.43	.22
-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	G3	C	B	G4W
VALUES	54.36	100.64	111.54	117.33	120.49	123.78	127.96	131.31	131.51	161.51	161.92
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	379.12	457.83	538.96	599.98	706.43	717.26	729.99	730.04	780.40	835.80	1449.79
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	1.20	.94	.75	.65	.53	.52	.52	.48	.44	.44	.23
-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	C	G3	B	G4W
VALUES	52.65	91.49	106.86	111.30	114.46	119.99	122.66	123.38	124.83	154.03	154.43
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	369.97	456.12	532.94	591.85	701.14	713.47	722.51	725.34	772.91	829.78	1443.31
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	1.23	.95	.76	.66	.54	.53	.53	.49	.45	.45	.23
-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	C	D	E	G3	B	G4W
VALUES	50.92	81.75	101.81	104.69	107.91	114.70	115.97	117.24	117.77	146.06	146.45
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	360.22	454.39	526.38	583.17	695.71	709.44	714.54	720.29	764.93	823.17	1436.24
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
VALUES	1.27	.95	.78	.68	.55	.54	.54	.51	.47	.46	.24

A.25

2R-4-8

2R-4-10

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 4-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 380.06

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

10	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G2	G4S	D	THRIE	E	A	G3	C	B	G4W	G4W
VALUES	64.85	108.40	142.56	147.36	157.14	160.63	169.17	178.88	183.28	208.25	208.70	208.70
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G3
VALUES	386.88	468.32	587.64	651.76	739.11	740.84	761.04	776.73	827.17	875.62	1497.35	1497.35
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3	G3
VALUES	.98	.78	.50	.42	.39	.38	.38	.31	.30	.28	.15	.15

8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G2	G4S	D	THRIE	E	A	G3	C	B	G4W	G4W
VALUES	63.50	103.50	138.45	144.24	152.20	156.45	162.05	172.39	177.06	202.64	203.13	203.13
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G3
VALUES	381.97	466.98	580.53	645.53	734.93	737.72	756.93	771.17	821.61	870.67	1490.87	1490.87
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3	G3
VALUES	.99	.78	.52	.43	.40	.39	.39	.32	.31	.29	.16	.16

6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G2	G4S	D	THRIE	E	A	G3	C	B	G4W	G4W
VALUES	62.10	98.58	134.16	141.01	146.87	152.04	154.70	165.58	170.30	196.65	197.08	197.08
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G3
VALUES	377.06	465.58	573.18	638.78	730.56	734.44	752.63	765.12	815.56	865.34	1484.05	1484.05
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3	G3
VALUES	1.01	.79	.54	.45	.40	.39	.39	.32	.32	.30	.16	.16

4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G2	G4S	D	THRIE	A	E	G3	C	B	G4W	G4W
VALUES	60.63	93.73	129.72	137.70	141.14	147.28	147.55	158.54	163.05	190.14	190.57	190.57
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G3
VALUES	372.21	464.11	565.76	631.52	726.03	731.18	748.20	758.61	809.05	859.66	1477.02	1477.02
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3	G3
VALUES	1.03	.79	.56	.46	.41	.40	.40	.33	.33	.31	.17	.17

2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G2	G4S	D	THRIE	A	E	G3	C	B	G4W	G4W
VALUES	59.12	89.02	125.20	134.33	135.26	139.98	142.87	151.44	155.38	183.25	183.67	183.67
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G3
VALUES	367.49	462.59	558.46	623.86	721.34	727.80	743.67	751.72	802.15	853.73	1469.92	1469.92
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3	G3
VALUES	1.05	.80	.57	.48	.41	.41	.41	.35	.34	.32	.17	.17

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 4-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 380.06
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	D	A	E	G3	C	B	G4W
VALUES	57.55	84.49	120.65	129.22	130.89	133.03	138.04	144.46	147.47	176.04	176.51
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	362.97	461.03	551.50	615.95	716.52	729.37	739.13	744.57	744.99	847.70	1462.94
BENEFIT/COST	G1	G2	A	C	D	G4S	E	B	THRIE	G4W	G3
VALUES	1.06	.80	.59	.50	.42	.42	.42	.36	.35	.33	.18
-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	G3	C	B	G4W
VALUES	55.96	80.18	116.12	123.23	126.55	127.39	133.08	137.75	139.48	168.82	169.24
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	358.66	459.43	545.02	607.96	711.55	720.87	734.59	737.30	787.71	841.70	1456.23
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
VALUES	1.08	.80	.61	.51	.43	.43	.43	.37	.36	.34	.18
-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	G3	C	B	G4W
VALUES	54.32	76.04	111.56	117.33	120.49	123.78	127.96	131.31	131.51	161.51	161.92
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	354.51	457.80	538.96	599.98	706.43	717.26	729.99	730.04	780.40	835.80	1449.79
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
VALUES	1.09	.81	.62	.53	.44	.43	.43	.38	.37	.35	.19
-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	G3	C	B	G4W
VALUES	52.64	72.03	106.86	111.30	114.46	119.99	122.66	123.38	124.83	154.03	154.43
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	350.51	456.12	532.94	591.85	701.14	713.47	722.51	725.34	772.91	829.78	1449.31
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
VALUES	1.11	.81	.63	.55	.44	.44	.44	.40	.37	.36	.19
-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	C	D	E	G3	B	G4W
VALUES	50.92	68.19	101.81	104.69	107.91	114.70	115.97	117.24	117.77	146.06	146.45
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	346.66	454.39	526.38	583.17	695.71	709.44	714.54	720.29	764.93	823.17	1436.24
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
VALUES	1.12	.82	.65	.57	.45	.45	.44	.41	.38	.38	.20

A.27

2R-4-10

2R-4-12

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 4-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 334.21

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	C	G3	B	G4W
	VALUES	64.85	72.24	142.56	147.36	157.14	160.63	169.17	173.79	183.28	208.25	208.70
	TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	350.71	468.32	587.64	651.76	739.11	740.84	761.04	776.73	827.17	875.62	1492.27
	BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
	VALUES	.94	.67	.39	.32	.31	.31	.30	.25	.22	.20	.12

8	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	C	G3	B	G4W
	VALUES	63.50	69.74	138.45	144.24	152.20	156.45	162.05	168.52	177.06	202.69	203.13
	TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	348.21	466.98	580.53	645.53	734.93	737.72	756.93	771.17	821.61	870.67	1487.00
	BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
	VALUES	.95	.67	.41	.34	.32	.32	.31	.25	.23	.21	.13

A.28

6	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	C	G3	B	G4W
	VALUES	62.10	67.44	134.16	141.01	146.87	152.09	154.70	162.83	170.30	196.65	197.08
	TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	345.91	465.58	573.18	638.78	730.56	734.49	752.63	765.12	815.56	865.34	1481.31
	BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
	VALUES	.96	.67	.43	.35	.33	.32	.31	.26	.24	.22	.13

4	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	C	G3	B	G4W
	VALUES	60.63	65.41	129.72	137.70	141.19	147.28	147.55	156.77	163.05	190.14	190.57
	TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	343.88	464.11	565.76	631.52	726.03	731.18	748.20	758.61	809.05	859.66	1475.25
	BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
	VALUES	.97	.68	.45	.37	.33	.33	.32	.27	.25	.23	.13

2	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	C	G3	B	G4W
	VALUES	59.12	63.70	125.20	134.33	135.26	139.98	142.87	150.45	155.38	183.25	183.67
	TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	342.17	462.59	558.46	623.86	721.34	727.80	743.67	751.72	802.15	853.73	1468.92
	BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
	VALUES	.97	.68	.46	.38	.34	.34	.33	.28	.27	.24	.14

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 4-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 334.21
 ADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	D	A	E	G3	C	B	G4W
VALUES	57.55	62.34	120.65	129.22	130.89	133.03	138.04	144.00	147.47	176.09	176.51
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	340.82	461.03	551.50	615.95	716.52	724.37	739.13	744.57	794.99	847.70	1462.47
BENEFIT/COST	G1	G2	A	C	G4S	D	E	THRIE	B	G4W	G3
VALUES	.98	.69	.48	.40	.35	.34	.34	.29	.28	.25	.14

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	G3	C	B	G4W
VALUES	55.96	61.31	116.12	123.23	126.55	127.39	133.08	137.59	139.48	168.82	169.24
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	339.79	459.43	545.02	607.96	711.55	720.87	734.59	737.30	787.71	841.70	1456.07
BENEFIT/COST	G1	G2	A	C	G4S	D	E	THRIE	B	G4W	G3
VALUES	.98	.69	.50	.42	.35	.35	.35	.29	.29	.27	.15

A.29

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	G3	C	B	G4W
VALUES	54.32	60.52	111.56	117.33	120.49	123.78	127.46	131.28	131.51	161.51	161.92
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	338.99	457.80	538.96	599.98	706.43	717.26	729.99	730.04	780.40	835.80	1449.75
BENEFIT/COST	G1	G2	A	C	G4S	E	D	B	THRIE	G4W	G3
VALUES	.98	.69	.51	.43	.36	.36	.35	.30	.30	.28	.15

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	C	G3	B	G4W
VALUES	52.64	59.84	106.86	111.30	114.46	119.99	122.66	123.38	124.83	154.03	154.43
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	338.31	456.12	532.94	591.85	701.14	713.47	722.51	725.34	772.91	829.78	1443.30
BENEFIT/COST	G1	G2	A	C	G4S	E	D	B	THRIE	G4W	G3
VALUES	.99	.70	.53	.45	.37	.37	.36	.32	.31	.29	.16

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	C	D	E	G3	B	G4W
VALUES	50.92	59.19	101.81	104.69	107.91	114.70	115.97	117.24	117.77	146.06	146.45
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	337.66	454.39	526.38	583.17	695.71	709.44	714.54	720.29	764.93	823.17	1436.24
BENEFIT/COST	G1	G2	A	C	G4S	E	D	B	THRIE	G4W	G3
VALUES	.99	.70	.54	.47	.38	.38	.37	.33	.32	.30	.16

2R-4-12

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 5 FT

2R-5-0

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 5 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 253.27

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	A	E	G2	G3	C	B	G4W	G1
VALUES	147.37	150.54	157.31	163.43	163.83	165.16	181.30	184.36	211.41	211.83	400.16
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	588.64	581.90	657.84	678.63	742.30	744.01	765.85	779.88	830.31	875.79	1499.78
BENEFIT/COST	G2	A	D	G4S	E	C	THRIE	B	G4W	G3	G1
VALUES	.22	.21	.17	.17	.15	.14	.13	.07	.07	.05	.53

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	G2	A	E	G3	C	B	G4W	G1
VALUES	142.52	146.51	153.02	156.74	158.06	158.28	174.94	182.62	205.30	205.72	393.78
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	580.21	576.53	651.10	672.26	737.30	739.99	760.99	773.77	824.20	871.50	1493.42
BENEFIT/COST	G2	A	D	G4S	E	C	THRIE	B	G4W	G3	G1
VALUES	.24	.23	.18	.18	.16	.15	.14	.08	.08	.06	.50

A.30

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	G2	A	E	G3	C	B	G4W	G1
VALUES	137.51	142.44	147.52	148.28	152.24	153.73	168.23	175.38	198.74	194.16	386.63
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	551.00	570.76	643.85	665.11	732.20	735.92	755.99	767.22	817.64	866.76	1486.70
BENEFIT/COST	G2	A	G4S	D	E	C	THRIE	B	G4W	G3	G1
VALUES	.26	.24	.19	.19	.17	.17	.15	.10	.09	.06	.48

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	A	E	E	G3	C	B	G4W	G1
VALUES	132.42	137.50	138.39	143.05	146.14	148.60	161.20	167.64	191.76	192.18	378.60
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	510.97	564.62	636.11	657.07	727.08	731.87	750.89	760.24	810.65	861.53	1479.68
BENEFIT/COST	G2	A	G4S	D	E	C	THRIE	B	G4W	G3	G1
VALUES	.29	.26	.20	.19	.18	.18	.15	.11	.10	.07	.45

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	A	E	G3	C	B	G4W	G1
VALUES	126.74	127.33	134.44	137.36	139.71	143.51	153.95	159.47	184.41	184.82	369.58
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	530.22	558.19	627.95	648.06	721.98	727.92	745.81	752.88	803.29	855.83	1472.42
BENEFIT/COST	G2	A	G4S	C	D	E	THRIE	B	G4W	G3	G1
VALUES	.31	.27	.20	.20	.20	.19	.16	.12	.11	.08	.42

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 5 FT

2R-5-0

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 5 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 253.27

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	A	E	G3	C	B	G4W	G1
	VALUES	115.48	122.35	130.65	131.28	133.13	138.49	146.61	151.01	176.79	177.19	359.51
	TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
	VALUES	518.94	551.61	619.49	637.98	716.97	724.13	740.82	745.27	795.67	849.76	1465.08
	BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
	VALUES	.34	.29	.22	.21	.21	.20	.17	.13	.12	.08	-.38

-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	A	D	E	G3	C	B	G4W	G1
	VALUES	104.11	117.53	125.00	126.60	127.02	133.55	139.37	142.46	169.07	164.47	348.34
	TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
	VALUES	507.59	545.07	610.93	626.82	712.03	720.50	736.01	737.55	787.95	843.48	1457.84
	BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
	VALUES	.37	.30	.24	.22	.21	.21	.18	.15	.14	.09	-.34

A.31

-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	A	D	E	G3	C	B	G4W	G1
	VALUES	93.12	112.87	118.71	120.26	123.48	128.61	132.39	133.99	161.40	161.79	336.06
	TOTAL COST	G2	A	C	G1	E	D	B	G4S	G4W	THRIE	G3
	VALUES	496.59	538.74	602.46	614.54	707.09	716.96	729.87	731.35	780.26	837.19	1450.86
	BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
	VALUES	.40	.32	.25	.23	.22	.22	.19	.16	.15	.09	-.30

-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	A	D	E	G3	C	B	G4W	G1
	VALUES	82.68	108.22	112.46	114.09	119.87	123.53	125.61	125.61	153.76	154.14	322.61
	TOTAL COST	G2	A	C	G1	E	D	B	G4S	G4W	THRIE	G3
	VALUES	484.16	532.57	594.09	601.09	702.01	713.34	722.23	726.70	772.62	830.94	1444.09
	BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
	VALUES	.42	.33	.27	.23	.22	.22	.20	.18	.16	.10	-.25

-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	A	D	E	G3	C	B	G4W	G1
	VALUES	72.30	103.30	105.93	107.68	115.98	116.97	118.20	118.60	145.84	146.22	307.80
	TOTAL COST	G2	A	C	G1	E	D	B	G4S	G4W	THRIE	G3
	VALUES	475.78	526.15	585.45	586.27	696.68	709.46	714.32	721.78	764.70	824.41	1437.08
	BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
	VALUES	.45	.35	.29	.24	.23	.23	.21	.19	.17	.10	-.20

2R-5-2

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 5-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 7 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 615.45
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	1318.48
SOCIETAL COST	THRIE G3	D	C	C	A	G4S	E	B	G4W	G1
VALUES	193.27	258.81	262.08	267.57	334.27	364.67	368.18	405.98	406.41	410.12
TOTAL COST	C	A	G2	D	THRIE G1	E	B	G4S	G4W	G3
VALUES	736.04	762.75	813.60	855.55	911.75	918.35	946.66	974.46	983.14	1024.89
BENEFIT/COST	C	A	D	THRIE G2	E	E	G4S	B	G4W	G3
VALUES	.74	.65	.60	.59	.51	.43	.41	.37	.34	.27
										-.09

8 STATE COST	G1	G2	A	C	R	E	D	G4W	G4S	THRIE G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	1318.48
SOCIETAL COST	THRIE G3	D	C	C	A	G4S	E	B	G4W	G1
VALUES	185.82	248.60	252.67	256.65	334.89	354.14	358.46	395.28	395.70	397.54
TOTAL COST	C	A	G2	D	THRIE G1	E	B	G4S	G4W	G3
VALUES	725.13	753.36	801.02	846.14	904.30	918.27	936.93	963.76	972.62	1014.18
BENEFIT/COST	C	A	D	THRIE G2	E	E	G4S	B	G4W	G1
VALUES	.77	.67	.61	.60	.54	.44	.42	.39	.36	.28
										-.09

6 STATE COST	G1	G2	A	C	R	E	D	G4W	G4S	THRIE G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	1318.48
SOCIETAL COST	THRIE G3	D	C	C	A	G4S	E	B	G4W	G1
VALUES	177.91	237.28	242.33	244.53	324.17	342.33	347.56	383.10	383.42	383.52
TOTAL COST	C	A	G2	D	THRIE G1	E	B	G4S	G4W	G3
VALUES	713.00	742.65	786.89	835.80	896.39	918.14	926.04	951.58	960.81	1002.00
BENEFIT/COST	C	A	D	THRIE G2	E	E	G4S	B	G4W	G1
VALUES	.79	.70	.63	.61	.58	.46	.44	.41	.37	.29
										-.09

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	1318.48
SOCIETAL COST	THRIE G3	D	C	C	A	G4S	E	B	G4W	G1
VALUES	169.54	224.76	231.00	231.10	312.03	324.13	335.41	367.62	369.33	369.74
TOTAL COST	C	A	G2	D	THRIE G1	E	B	G4S	G4W	G3
VALUES	699.58	730.50	771.10	824.48	888.01	913.88	918.11	937.80	947.61	988.22
BENEFIT/COST	C	A	D	THRIE G2	E	E	G4S	B	G4W	G1
VALUES	.82	.73	.65	.62	.61	.48	.46	.43	.40	.30
										-.09

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	1318.48
SOCIETAL COST	THRIE G3	C	C	D	A	G4S	E	B	G4W	G1
VALUES	160.73	211.11	216.41	218.74	298.44	314.54	321.97	350.17	353.93	354.33
TOTAL COST	C	A	G2	D	THRIE G1	E	B	G4S	G4W	G3
VALUES	684.89	716.91	753.64	812.22	894.21	900.44	918.03	922.40	933.02	972.81
BENEFIT/COST	C	A	D	G2	THRIE	E	G4S	B	G4W	G1
VALUES	.85	.76	.67	.66	.63	.51	.49	.46	.42	.31
										-.09

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 5-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 7 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 615.45

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	G2	B	G4W	G1
	VALUES	151.61	146.58	200.70	205.75	283.52	248.66	307.31	331.21	337.03	337.43	639.47
	TOTAL COST	C	A	G2	D	THRIE	E	B	G4S	G1	G4W	G3
	VALUES	669.17	701.99	734.69	799.22	870.08	885.78	905.51	917.14	917.95	955.91	1515.06
	BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
	VALUES	.89	.79	.70	.69	.65	.53	.51	.49	.45	.32	-.09

-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	G2	B	G4W	G1
	VALUES	142.35	181.66	184.45	192.40	267.55	281.76	291.61	311.14	318.99	319.38	639.39
	TOTAL COST	C	A	G2	D	THRIE	E	B	G4S	G1	G4W	G3
	VALUES	652.92	686.03	714.61	785.87	860.83	870.08	887.46	900.24	917.86	937.86	1500.14
	BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
	VALUES	.92	.83	.75	.71	.66	.56	.54	.52	.48	.33	-.09

A.33

-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	G2	B	G4W	G1
	VALUES	133.15	166.96	168.28	179.16	250.88	264.14	275.10	290.39	300.22	300.61	639.30
	TOTAL COST	C	A	G2	D	THRIE	E	B	G4S	G1	G4W	G3
	VALUES	636.75	669.36	693.87	772.64	851.62	853.57	868.70	882.61	917.77	919.09	1485.44
	BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
	VALUES	.95	.87	.81	.74	.67	.59	.57	.55	.51	.34	-.09

-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	G2	B	G4W	G1
	VALUES	124.05	152.50	152.74	166.23	233.57	245.83	257.77	269.10	280.88	281.26	639.20
	TOTAL COST	C	A	G2	D	THRIE	E	B	G4S	G1	G4W	G3
	VALUES	620.48	652.05	672.57	759.71	836.24	842.52	849.35	864.31	899.73	917.68	1471.22
	BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
	VALUES	.99	.91	.86	.76	.68	.62	.60	.59	.54	.35	-.09

-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	G2	B	G4W	G1
	VALUES	114.74	136.50	138.31	153.05	214.92	226.21	239.09	246.47	260.23	260.60	639.10
	TOTAL COST	C	A	G2	D	THRIE	E	B	G4S	G1	G4W	G3
	VALUES	604.97	633.39	649.95	746.53	817.56	828.70	833.21	844.68	879.08	917.58	1456.79
	BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
	VALUES	1.02	.96	.91	.78	.70	.65	.63	.62	.57	.36	-.08

2R-5-2

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 5-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 9 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 534.10

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10 STATE COST	G1	G2	A	C	H	E	D	G4W	G4S	THR1E	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THR1E	A	G2	G3	C	E	B	G4W	G1
VALUES	147.75	151.05	163.13	163.43	165.16	181.30	189.36	192.19	213.61	214.04	524.64
TOTAL COST	G2	A	C	D	G4S	E	B	G1	G4W	THR1E	G3
VALUES	568.64	581.90	657.84	744.52	766.23	770.67	782.09	803.11	832.51	881.61	1449.78
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THR1E	G3	G1
VALUES	.91	.89	.74	.65	.62	.59	.56	.52	.52	.27	.03

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THR1E	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	G2	THR1E	A	G3	C	E	B	G4W	G1
VALUES	142.76	146.86	156.74	157.58	158.06	174.94	182.62	185.45	206.97	207.39	521.53
TOTAL COST	G2	A	C	D	G4S	E	B	G1	G4W	THR1E	G3
VALUES	560.21	576.53	651.10	740.33	761.23	763.92	775.44	800.01	825.87	876.06	1493.42
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THR1E	G3	G1
VALUES	.94	.90	.75	.65	.63	.60	.58	.53	.52	.27	.05

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THR1E	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	G2	THR1E	A	G3	C	E	B	G4W	G1
VALUES	137.68	142.68	147.52	151.63	152.29	168.23	175.38	178.56	199.96	200.38	518.21
TOTAL COST	G2	A	C	D	G4S	E	B	G1	G4W	THR1E	G3
VALUES	551.00	570.76	643.85	736.16	756.15	757.04	768.43	796.69	818.85	870.10	1486.70
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THR1E	G3	G1
VALUES	.96	.91	.77	.66	.64	.61	.59	.54	.53	.28	.06

4 STATE COST	G1	G2	A	C	R	E	D	G4W	G4S	THR1E	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THR1E	A	G3	G3	C	E	B	G4W	G1
VALUES	132.55	137.50	138.58	145.30	146.14	161.20	167.64	171.54	192.60	193.02	514.65
TOTAL COST	G2	A	C	D	E	G4S	B	G1	G4W	THR1E	G3
VALUES	540.97	564.62	636.11	732.06	750.02	751.03	761.08	793.13	811.49	863.78	1479.68
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THR1E	G3	G1
VALUES	.98	.93	.78	.67	.65	.63	.60	.55	.54	.28	.07

2 STATE COST	G1	G2	A	C	R	E	D	G4W	G4S	THR1E	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THR1E	A	G3	C	E	B	G4W	G1
VALUES	126.74	127.46	134.61	138.64	139.71	153.95	159.47	164.40	184.96	185.36	510.82
TOTAL COST	G2	A	C	D	E	G4S	B	G1	G4W	THR1E	G3
VALUES	530.22	558.19	627.95	728.08	742.88	745.94	753.43	789.29	803.84	857.17	1472.42
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THR1E	G3	G1
VALUES	1.01	.94	.80	.67	.66	.64	.61	.56	.55	.29	.08

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 5-FT SHOULDER

2R-5-4

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 9 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 534,10

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	A	G3	C	E	B	G4W	G1
VALUES	115.48	122.48	130.79	131.95	133.13	146.61	151.01	157.16	177.13	177.53	506.67
TOTAL COST	G2	A	C	D	E	G4S	B	G1	G4W	THRIE	G3
VALUES	518.96	551.61	619.49	724.27	735.64	740.95	745.60	785.15	796.00	850.42	1465.08
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THRIE	G3	G1
VALUES	1.04	.96	.82	.68	.67	.65	.63	.58	.56	.29	.10

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	G3	C	E	B	G4W	G1
VALUES	104.11	117.64	125.25	126.60	127.14	139.37	142.46	149.80	169.26	169.66	502.18
TOTAL COST	G2	A	C	D	E	G4S	B	G1	G4W	THRIE	G3
VALUES	507.59	545.07	610.93	720.61	728.28	736.12	737.74	780.66	788.13	843.73	1457.84
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THRIE	G3	G1
VALUES	1.07	.97	.84	.69	.67	.66	.64	.59	.57	.30	.11

A.35

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	G3	C	E	B	G4W	G1
VALUES	93.12	112.95	118.77	120.26	123.56	132.39	133.99	142.28	161.49	161.88	497.30
TOTAL COST	G2	A	C	D	E	B	G4S	G1	G4W	THRIE	G3
VALUES	496.59	538.74	602.46	717.03	720.76	729.97	731.42	775.78	780.36	837.25	1450.86
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THRIE	G3	G1
VALUES	1.09	.99	.85	.69	.68	.68	.66	.60	.58	.30	.13

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	G3	C	E	B	G4W	G1
VALUES	82.68	108.26	112.47	114.09	119.90	125.61	125.61	134.54	153.80	154.18	492.00
TOTAL COST	G2	A	C	E	D	B	G4S	G1	G4W	THRIE	G3
VALUES	486.16	532.57	594.09	713.02	713.38	722.27	726.74	770.48	772.66	830.95	1444.09
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G3	G1
VALUES	1.12	1.00	.87	.70	.69	.69	.67	.61	.59	.31	.15

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	C	G3	E	B	G4W	G1
VALUES	72.30	103.32	105.93	107.68	116.00	116.97	118.60	126.59	145.86	146.23	486.27
TOTAL COST	G2	A	C	E	D	B	G4S	G1	G4W	THRIE	G3
VALUES	475.78	526.15	585.45	705.06	709.47	714.33	721.79	764.71	764.75	824.41	1437.08
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G3	G1
VALUES	1.14	1.02	.89	.70	.70	.70	.68	.63	.60	.32	.17

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 5-FT SHOULDER

2R-5-6

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 11 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 464.83

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

OF CURVE

A.36

1	2	3	4	5	6	7	8	9	10	11	
10	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	B	G4W	G1
	VALUES	70.95	147.37	150.54	157.31	163.83	168.60	181.31	206.04	206.47	366.55
	TOTAL COST	G2	A	G1	C	E	D	G4S	B	THRIE	G3
	VALUES	474.43	587.07	645.03	652.28	742.30	744.01	765.85	824.95	875.79	1499.78
	BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G1	G3
	VALUES	.98	.71	.60	.53	.52	.51	.46	.42	.35	.22
8	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	B	G4W	G1
	VALUES	67.83	142.52	146.51	153.02	158.82	162.10	174.94	201.10	201.53	361.34
	TOTAL COST	G2	A	G1	C	E	D	G4S	B	THRIE	G3
	VALUES	471.31	580.58	639.82	646.76	737.30	739.99	760.99	820.00	871.50	1493.42
	BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G1	G3
	VALUES	.98	.72	.61	.54	.53	.52	.46	.43	.37	.22
6	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	B	G4W	G1
	VALUES	64.81	137.51	142.44	148.28	153.73	155.25	168.23	172.19	196.09	355.41
	TOTAL COST	G2	A	G1	C	E	D	G4S	B	THRIE	G3
	VALUES	468.28	573.73	633.89	640.67	732.20	735.92	755.99	814.56	866.76	1486.70
	BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G1	G3
	VALUES	.99	.74	.62	.54	.54	.53	.47	.44	.39	.22
4	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	B	G4W	G1
	VALUES	61.95	132.42	138.39	143.05	148.13	148.60	161.20	165.50	190.11	348.66
	TOTAL COST	G2	A	G1	C	E	D	G4S	B	THRIE	G3
	VALUES	465.42	566.61	627.13	633.98	727.08	731.87	750.89	758.17	861.53	1479.68
	BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G1	G3
	VALUES	1.00	.76	.64	.55	.55	.54	.48	.45	.42	.23
2	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	B	G4W	G1
	VALUES	59.31	127.33	134.44	137.36	140.89	143.51	153.95	158.20	183.18	340.99
	TOTAL COST	G2	A	G1	C	E	D	G4S	B	THRIE	G3
	VALUES	462.79	559.37	619.47	626.68	721.98	727.92	745.81	751.66	855.83	1472.42
	BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G1	G3
	VALUES	1.01	.77	.65	.56	.56	.55	.50	.46	.44	.24

A.36

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 5-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 11 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 464.83
 ADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11
 PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	A	E	G3	C	B	G4W	G1
	VALUES	56.96	122.35	130.65	131.28	133.72	138.49	146.61	150.38	176.18	176.59	332.35
	TOTAL COST	G2	A	G1	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	460.43	552.20	610.83	618.86	716.97	724.13	740.82	744.66	795.06	849.76	1465.08
	BENEFIT/COST	G2	A	C	E	D	G4S	B	G1	G4W	THRIE	G3
	VALUES	1.01	.79	.67	.56	.56	.55	.51	.48	.47	.46	.24

-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	A	D	E	G3	C	B	G4W	G1
	VALUES	54.84	117.53	125.00	126.82	127.02	133.55	139.37	142.22	168.84	169.24	322.69
	TOTAL COST	G2	A	G1	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	458.36	545.90	601.17	610.69	712.03	720.50	736.01	737.32	787.72	843.48	1457.84
	BENEFIT/COST	G2	A	C	E	D	G4S	B	G1	G4W	THRIE	G3
	VALUES	1.02	.81	.69	.57	.57	.56	.52	.51	.48	.47	.25

A.37

-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	A	D	E	G3	C	B	G4W	G1
	VALUES	53.05	112.87	118.71	120.32	123.48	128.61	132.39	133.93	161.34	161.73	312.00
	TOTAL COST	G2	A	G1	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	456.53	538.79	590.47	602.40	707.09	716.96	729.82	731.35	780.21	837.19	1450.86
	BENEFIT/COST	G2	A	C	E	D	G4S	G1	B	G4W	THRIE	G3
	VALUES	1.02	.82	.71	.58	.58	.57	.55	.53	.49	.48	.25

-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	A	D	E	C	G3	B	G4W	G1
	VALUES	51.33	108.22	112.46	114.10	119.87	123.53	125.60	125.61	153.75	154.13	300.18
	TOTAL COST	G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	454.81	532.57	578.65	584.08	702.01	713.34	722.22	726.70	772.61	830.94	1444.09
	BENEFIT/COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
	VALUES	1.02	.84	.72	.59	.59	.58	.58	.55	.50	.49	.26

-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	A	D	C	E	G3	B	G4W	G1
	VALUES	49.62	103.30	105.93	107.68	115.48	116.97	118.20	118.60	145.84	146.22	287.02
	TOTAL COST	G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	453.09	526.16	565.49	585.45	696.68	709.46	714.32	721.28	764.70	824.41	1437.08
	BENEFIT/COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
	VALUES	1.03	.85	.74	.64	.60	.59	.58	.56	.52	.50	.26

2R-5-6

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 5-FT SHOULDER

2R-5-8

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 13 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 406.01

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G1	C	B	G4W
VALUES	68.57	142.01	144.98	157.31	158.83	168.57	172.86	179.02	183.83	206.45
TOTAL COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	451.33	472.05	587.05	652.30	737.30	738.46	760.48	774.44	824.42	1447.44
BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
VALUES	.84	.84	.57	.47	.44	.43	.43	.35	.32	.17

8 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G1	C	B	G4W
VALUES	66.04	138.32	142.17	153.02	154.92	162.09	164.35	173.21	178.29	201.52
TOTAL COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	442.83	469.51	580.57	646.76	733.39	735.64	756.80	769.57	819.99	1491.69
BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
VALUES	.87	.84	.58	.49	.44	.43	.43	.36	.35	.18

6 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G1	C	B	G4W
VALUES	63.51	134.44	139.26	148.28	150.87	155.11	155.25	166.47	172.20	195.67
TOTAL COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	433.59	466.48	573.72	640.67	729.35	732.73	752.91	764.14	814.56	1485.45
BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
VALUES	.90	.85	.60	.50	.45	.44	.44	.37	.36	.18

4 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G1	C	B	G4W
VALUES	61.05	130.35	136.26	143.05	145.12	146.68	148.13	160.33	165.50	189.70
TOTAL COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	423.60	464.52	566.61	633.98	725.16	729.73	748.83	758.17	808.59	1478.80
BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
VALUES	.94	.85	.62	.51	.45	.45	.45	.38	.37	.19

2 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G1	C	B	G4W
VALUES	58.73	126.11	133.17	134.47	137.36	140.89	142.37	153.38	158.20	183.18
TOTAL COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	412.94	462.20	559.37	626.68	720.84	726.65	744.58	751.66	802.07	1471.85
BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
VALUES	.98	.86	.63	.53	.46	.46	.45	.39	.37	.19

A.38

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 5-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 13 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 406.01

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	G1	D	THRIE	A	E	G3	C	B	G4W
	VALUES	56.60	121.74	123.37	130.02	131.28	133.72	137.42	146.26	150.38	176.18	176.59
	TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	401.85	460.08	552.20	618.86	716.40	723.50	740.22	744.66	795.06	849.76	1464.74
	BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G4W	G3
	VALUES	1.01	.87	.65	.55	.47	.46	.46	.40	.38	.37	.20

-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	D	A	E	G3	C	B	G4W
	VALUES	54.69	112.24	117.30	125.00	126.78	126.82	133.34	139.18	142.22	168.84	169.24
	TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	390.71	458.17	545.30	610.69	711.81	720.26	735.78	737.32	787.72	843.48	1457.65
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
	VALUES	1.05	.87	.67	.56	.47	.47	.47	.42	.39	.38	.20

A.39

-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	G3	C	B	G4W
	VALUES	52.95	101.53	112.81	118.71	120.32	123.42	128.56	132.29	133.93	161.34	161.73
	TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	380.00	456.43	538.79	602.40	707.03	716.90	729.82	731.29	780.21	837.19	1450.77
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
	VALUES	1.09	.88	.68	.58	.48	.48	.47	.43	.40	.39	.21

-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	G3	C	B	G4W
	VALUES	51.29	91.43	108.21	112.46	114.10	119.86	123.52	125.57	125.60	153.75	154.13
	TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	369.91	454.77	532.57	594.08	702.00	713.33	722.22	726.69	772.61	830.94	1444.04
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
	VALUES	1.13	.88	.70	.60	.49	.48	.48	.44	.41	.41	.21

-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	A	D	C	E	G3	B	G4W
	VALUES	49.60	81.44	103.30	105.93	107.68	115.98	116.97	118.20	118.59	145.84	146.22
	TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	359.92	453.08	526.16	585.45	696.68	709.46	714.32	721.78	764.70	824.41	1437.06
	BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
	VALUES	1.17	.88	.71	.62	.50	.49	.49	.46	.42	.42	.22

2R-5-8

2R-5-10

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 5-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 15 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 355,18
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	62.73	107.86	141.98	144.96	157.31	158.83	168.57	179.02	183.83	206.02	206.45
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	386.34	466.21	587.05	652.30	737.30	738.43	760.46	774.49	824.92	875.79	1497.49
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.89	.73	.45	.37	.36	.35	.34	.28	.26	.24	.13
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	61.47	102.82	138.32	142.16	153.02	154.92	162.09	173.21	178.29	201.09	201.52
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	381.30	464.94	580.57	646.76	733.39	735.63	756.79	769.57	819.99	871.50	1491.69
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.91	.73	.46	.38	.36	.35	.35	.28	.27	.25	.14
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	60.16	97.81	134.43	139.25	148.28	150.87	155.25	166.97	172.20	195.67	196.09
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	376.29	463.63	573.72	640.67	729.35	732.73	752.91	764.14	814.56	866.76	1485.45
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.93	.73	.48	.39	.37	.36	.35	.29	.28	.26	.14
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	58.80	92.90	130.35	136.25	143.05	146.68	148.13	160.33	165.50	189.70	190.11
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	371.37	462.27	566.61	639.98	725.16	729.73	748.83	758.17	808.59	861.53	1478.80
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.95	.74	.50	.41	.37	.37	.36	.30	.29	.27	.15
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	A	E	G3	C	B	G4W
VALUES	57.39	88.14	126.11	133.17	137.36	140.89	142.37	153.38	158.20	183.18	183.59
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	366.61	460.87	559.37	626.68	720.84	726.65	744.58	751.66	802.07	855.83	1471.85
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.96	.74	.51	.42	.38	.37	.37	.30	.30	.28	.15

A.40

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 5-FT SHOULDER

2R-5-10

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 15 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 356.18

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0	STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4W 618.48	THR1E 718.48	G3 1318.48
	SOCIETAL COST	G1 55.44	G2 83.60	A 121.74	C 130.02	B 131.28	E 133.72	D 137.92	G4W 146.26	THR1E 176.18	G3 176.54
	TOTAL COST	G1 362.07	G2 487.08	A 540.22	C 608.50	B 700.76	E 712.20	D 731.40	G4W 764.74	THR1E 894.66	G3 1494.74
	BENEFIT/COST	G1 .98	G2 .74	A .53	C .44	B .38	E .38	D .38	G4W .32	THR1E .29	G3 .16
-2	STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4W 618.48	THR1E 718.48	G3 1318.48
	SOCIETAL COST	G1 54.44	G2 79.29	A 117.30	C 125.00	B 126.78	E 126.82	D 133.34	G4W 139.18	THR1E 168.84	G3 169.24
	TOTAL COST	G1 357.76	G2 482.77	A 535.78	C 593.48	B 695.26	E 705.30	D 726.82	G4W 755.66	THR1E 887.32	G3 1487.65
	BENEFIT/COST	G1 .99	G2 .75	A .55	C .46	B .39	E .39	D .39	G4W .33	THR1E .30	G3 .16
-4	STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4W 618.48	THR1E 718.48	G3 1318.48
	SOCIETAL COST	G1 52.89	G2 75.16	A 112.81	C 118.71	B 120.32	E 123.42	D 128.56	G4W 132.29	THR1E 161.34	G3 161.73
	TOTAL COST	G1 353.64	G2 478.65	A 531.29	C 587.19	B 688.80	E 691.84	D 712.04	G4W 750.58	THR1E 879.82	G3 1480.21
	BENEFIT/COST	G1 1.01	G2 .75	A .56	C .47	B .39	E .39	D .39	G4W .34	THR1E .31	G3 .17
-6	STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4W 618.48	THR1E 718.48	G3 1318.48
	SOCIETAL COST	G1 51.28	G2 71.15	A 108.21	C 112.46	B 114.10	E 119.86	D 123.52	G4W 125.57	THR1E 153.75	G3 154.13
	TOTAL COST	G1 349.63	G2 474.63	A 526.69	C 580.94	B 682.58	E 698.34	D 717.00	G4W 754.05	THR1E 892.19	G3 1492.61
	BENEFIT/COST	G1 1.02	G2 .76	A .58	C .49	B .40	E .40	D .40	G4W .36	THR1E .33	G3 .17
-8	STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4W 618.48	THR1E 718.48	G3 1318.48
	SOCIETAL COST	G1 49.60	G2 67.21	A 103.30	C 105.93	B 107.68	E 115.98	D 116.97	G4W 118.20	THR1E 145.84	G3 146.22
	TOTAL COST	G1 345.69	G2 470.69	A 521.78	C 574.37	B 676.16	E 694.46	D 710.45	G4W 756.40	THR1E 894.32	G3 1494.64
	BENEFIT/COST	G1 1.04	G2 .76	A .59	C .51	B .41	E .41	D .41	G4W .37	THR1E .35	G3 .18

A.41

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 5-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 17 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 314.01

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	62.73	70.70	141.98	144.96	157.31	158.83	168.57	173.37	183.83	206.02	206.45
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	344.17	466.21	587.05	652.30	737.30	738.43	760.46	774.49	824.92	875.79	1491.84
BENEFIT/COST	G1	G2	A	D	G4S	C	E	THRIE	B	G4W	G3
VALUES	.87	.62	.35	.28	.28	.28	.27	.22	.19	.17	.11
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	61.47	68.09	138.32	142.16	153.02	154.92	162.09	168.79	178.29	201.09	201.52
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	346.57	464.94	580.57	646.76	733.39	735.63	756.79	769.57	819.99	871.50	1487.27
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.88	.63	.36	.29	.29	.28	.28	.22	.20	.18	.11
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	60.16	65.65	134.43	139.25	148.28	150.87	155.25	163.73	172.20	195.67	196.09
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	344.13	463.63	573.72	640.67	729.35	732.73	752.91	764.14	814.56	866.76	1482.21
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.89	.63	.38	.30	.29	.29	.28	.23	.21	.19	.11
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	58.80	63.45	130.35	136.25	143.05	146.68	148.13	158.15	165.50	189.70	190.11
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	341.93	462.27	566.61	633.98	725.16	729.73	748.83	758.17	808.59	861.53	1476.63
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.90	.63	.40	.32	.30	.30	.29	.24	.22	.20	.12
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	57.39	61.56	126.11	133.17	137.36	140.89	142.37	152.09	158.20	183.18	183.59
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	340.04	460.87	559.37	626.68	720.84	726.65	744.58	751.66	802.07	855.83	1470.56
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.91	.64	.41	.33	.30	.30	.30	.25	.23	.21	.12

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 5-FT SHOULDER

2R-5-12

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 17 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 314.01

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
0	STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	A	E	G3	B	G4W
	VALUES	55.44	60.04	121.74	130.02	131.28	133.72	137.92	145.62	150.38	176.54
	TOTAL COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
	VALUES	338.52	459.41	552.20	618.86	716.40	723.50	740.22	744.66	849.76	1464.10
	BENEFIT/COST	G1	G2	A	C	G4S	D	E	THRIE	B	G3
	VALUES	.91	.64	.43	.35	.31	.31	.30	.25	.24	.13
-2	STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	D	A	E	G3	B	G4W
	VALUES	54.44	58.89	117.30	125.00	126.28	126.82	133.34	138.93	142.22	168.24
	TOTAL COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
	VALUES	337.36	457.91	545.30	610.69	711.81	720.26	735.78	737.32	843.48	1457.41
	BENEFIT/COST	G1	G2	A	C	G4S	D	E	THRIE	B	G3
	VALUES	.92	.64	.45	.37	.32	.32	.31	.26	.23	.13
-4	STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	G3	B	G4W
	VALUES	52.84	58.03	112.81	118.71	120.32	123.42	128.56	132.23	133.93	161.73
	TOTAL COST	G1	G2	A	C	E	D	B	G4S	THRIE	G3
	VALUES	336.51	456.37	538.79	602.40	707.03	716.90	729.82	731.29	837.19	1450.70
	BENEFIT/COST	G1	G2	A	C	G4S	D	E	THRIE	B	G3
	VALUES	.92	.65	.46	.38	.33	.32	.32	.27	.25	.14
-6	STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	G3	B	G4W
	VALUES	51.28	57.34	108.21	112.46	114.10	114.86	123.52	125.56	125.60	154.13
	TOTAL COST	G1	G2	A	C	E	D	B	G4S	THRIE	G3
	VALUES	335.81	454.76	532.57	594.08	702.00	713.33	722.22	726.49	830.94	1444.04
	BENEFIT/COST	G1	G2	A	C	G4S	E	D	THRIE	B	G3
	VALUES	.92	.65	.48	.40	.33	.33	.33	.28	.26	.14
-8	STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	A	D	C	E	B	G4W
	VALUES	49.60	56.68	103.30	105.93	107.68	115.98	116.97	118.20	118.59	146.22
	TOTAL COST	G1	G2	A	C	E	D	B	G4S	THRIE	G3
	VALUES	335.16	453.08	526.16	585.45	696.68	709.46	714.32	721.78	824.41	1437.06
	BENEFIT/COST	G1	G2	A	C	G4S	E	D	THRIE	B	G3
	VALUES	.92	.66	.49	.42	.34	.34	.33	.30	.27	.15

A.43

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 6 FT

2R-6-0

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 6 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 235.64

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	A	E	G2	G3	C	B	B	G4W	G1
VALUES	145.34	147.14	154.84	160.16	161.51	166.39	179.28	188.04	207.70	208.11	386.29	
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3	
VALUES	569.67	578.64	656.51	664.77	739.99	740.66	763.82	776.18	826.58	873.32	1497.75	
BENEFIT/COST	A	G2	D	G4S	E	THRIE	C	B	G4W	G3	G1	
VALUES	.18	.17	.15	.15	.13	.11	.10	.05	.04	.04	.54	

8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	A	E	G2	G3	C	B	B	G4W	G1
VALUES	140.90	143.44	151.23	155.42	156.61	158.52	173.53	181.87	202.10	202.50	380.99	
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3	
VALUES	561.44	573.90	650.35	659.47	735.09	736.92	759.37	770.58	820.98	869.70	1492.01	
BENEFIT/COST	A	G2	D	G4S	E	THRIE	C	B	G4W	G3	G1	
VALUES	.19	.19	.16	.15	.14	.12	.11	.06	.05	.05	.52	

A.44

6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	G2	A	E	G3	C	B	B	G4W	G1
VALUES	136.28	139.64	147.17	149.91	150.26	151.65	167.42	175.23	196.09	196.49	375.07	
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3	
VALUES	553.38	568.74	643.71	653.55	730.13	733.12	754.76	784.57	814.97	865.65	1485.84	
BENEFIT/COST	G2	A	D	G4S	E	C	THRIE	B	G4W	G3	G1	
VALUES	.21	.20	.16	.16	.15	.13	.12	.07	.06	.05	.50	

4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	G2	THRIE	A	E	G3	C	B	B	G4W	G1
VALUES	131.55	135.84	140.46	142.60	144.67	146.69	160.92	168.08	189.64	190.04	368.41	
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3	
VALUES	543.93	563.15	636.56	646.88	725.17	729.31	750.02	758.12	808.51	861.08	1479.40	
BENEFIT/COST	G2	A	G4S	D	E	C	THRIE	B	G4W	G3	G1	
VALUES	.24	.22	.17	.17	.15	.14	.13	.08	.07	.06	.48	

2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	G2	THRIE	A	E	G3	C	B	B	G4W	G1
VALUES	126.75	130.10	132.11	137.46	138.68	141.79	154.07	160.42	182.76	183.15	360.87	
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3	
VALUES	533.57	557.15	628.90	639.35	720.27	725.54	745.23	751.23	801.62	855.93	1472.55	
BENEFIT/COST	G2	A	G4S	D	E	C	THRIE	B	G4W	G3	G1	
VALUES	.26	.23	.18	.17	.16	.16	.14	.09	.08	.06	.45	

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 6 FT

2R-6-0

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 6 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 235.64

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	276.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	A	E	G3	C	B	G4W	G1
VALUES	118.84	122.00	128.53	131.75	132.34	137.01	146.44	152.29	175.47	175.86	352.35
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	522.36	550.81	620.77	630.83	715.44	722.01	740.47	743.95	794.34	850.23	1465.42
BENEFIT/COST	G2	A	G4S	D	C	E	THRIE	B	G4W	G3	G1
VALUES	.29	.25	.18	.18	.18	.17	.14	.11	.10	.07	-.42

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	A	E	G3	C	B	G4W	G1
VALUES	107.06	117.35	125.14	125.57	125.80	132.37	139.66	143.83	167.90	168.28	342.74
TOTAL COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	510.54	544.27	612.31	621.22	710.85	718.61	735.82	736.37	786.75	844.05	1458.14
BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
VALUES	.32	.26	.20	.14	.14	.18	.15	.12	.11	.07	-.38

A.45

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	E	G3	C	B	G4W	G1
VALUES	95.12	112.83	119.14	119.25	121.87	127.74	132.43	135.24	160.14	160.56	332.00
TOTAL COST	G2	A	C	G1	E	D	B	G4S	G4W	THRIE	G3
VALUES	498.59	537.73	603.72	610.48	706.27	715.35	728.67	731.30	779.04	837.61	1450.91
BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
VALUES	.35	.28	.21	.20	.14	.14	.16	.13	.12	.08	-.35

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	E	G3	C	B	G4W	G1
VALUES	83.62	108.36	112.70	112.87	118.60	123.12	125.42	126.71	152.44	152.86	320.08
TOTAL COST	G2	A	C	G1	E	D	B	G4S	G4W	THRIE	G3
VALUES	487.04	531.35	595.18	598.56	701.60	712.07	720.97	726.84	771.34	831.18	1443.84
BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
VALUES	.38	.29	.23	.21	.20	.14	.17	.15	.13	.08	-.30

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	E	G3	C	B	G4W	G1
VALUES	72.68	103.75	106.24	106.54	115.04	118.16	118.19	118.47	144.73	145.04	306.83
TOTAL COST	G2	A	C	G1	E	D	B	G4S	G4W	THRIE	G3
VALUES	476.15	525.02	595.31	586.63	696.66	708.57	713.20	722.23	763.56	824.72	1436.95
BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
VALUES	.40	.31	.25	.21	.20	.20	.18	.16	.15	.09	-.26

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 6-FT SHOULDER

2R-6-2

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 8 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 573.15

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	D	C	A	G4S	E	B	G4W	G2	G1
VALUES	193.14	258.52	261.91	268.38	336.45	359.79	362.03	398.84	399.25	410.22	595.64
TOTAL COST	C	A	G2	D	G1	THRIE	E	B	G4S	G4W	G3
VALUES	736.86	754.92	813.69	855.38	874.11	911.62	940.51	967.31	978.27	1017.72	1577.00
BENEFIT/COST	C	A	THRIE	D	G2	E	G4S	B	G4W	G3	G1
VALUES	.65	.57	.53	.52	.40	.36	.34	.31	.28	.24	-.08

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	D	C	A	G4S	E	B	G4W	G2	G1
VALUES	186.05	249.42	253.32	258.45	329.00	351.03	353.43	390.07	390.47	399.88	595.58
TOTAL COST	C	A	G2	D	G1	THRIE	E	B	G4S	G4W	G3
VALUES	726.93	747.48	803.35	846.80	874.06	904.53	932.40	958.55	969.51	1008.95	1567.89
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1
VALUES	.67	.58	.54	.54	.43	.38	.36	.32	.30	.25	-.08

A.46

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	D	C	A	G4S	E	B	G4W	G2	G1
VALUES	178.57	239.25	243.87	247.42	320.33	341.10	344.78	379.95	380.35	388.08	595.52
TOTAL COST	C	A	G2	D	G1	THRIE	E	B	G4S	G4W	G3
VALUES	715.89	738.80	791.56	837.35	874.00	897.05	923.25	948.42	959.58	998.82	1557.72
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1
VALUES	.70	.60	.55	.55	.46	.39	.38	.34	.31	.25	-.08

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	D	C	A	G4S	E	B	G4W	G2	G1
VALUES	170.64	227.84	233.43	235.08	310.23	329.82	334.43	368.25	368.64	374.60	595.46
TOTAL COST	C	A	G2	D	G1	THRIE	E	B	G4S	G4W	G3
VALUES	703.56	728.70	778.08	826.90	873.44	889.11	912.41	936.72	948.29	987.12	1546.32
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1
VALUES	.72	.63	.57	.57	.49	.41	.39	.36	.33	.26	-.08

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	B	G4W	G2	G1
VALUES	162.23	215.06	221.30	221.88	298.55	317.05	322.75	354.79	355.18	359.27	595.40
TOTAL COST	C	A	G2	D	G1	THRIE	E	B	G4S	G4W	G3
VALUES	689.77	717.03	762.75	815.35	873.88	880.71	901.23	923.26	935.52	973.65	1533.54
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1
VALUES	.75	.66	.59	.57	.53	.43	.41	.38	.35	.27	-.08

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 6-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 8 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 573.15
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

0 STATE COST
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST THRIE G3 C A D G4S E G4S G4W G4W G2 G1
 VALUES 153.37 200.93 206.06 209.24 285.25 302.74 309.68 339.49 339.49 342.04 595.35
 TOTAL COST C G2 D THRIE G1 E G4S G4W G3
 VALUES 674.53 703.72 745.52 802.72 871.85 873.82 888.15 907.96 921.21 958.35 1519.41
 BENEFIT/COST C A D THRIE G2 E G4S B G4W G3 G1
 VALUES .78 .69 .61 .58 .57 .46 .44 .41 .38 .28 -.08

-2 STATE COST
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST THRIE G3 C A D G4S E G4S G4W G4W G2 G1
 VALUES 144.17 185.73 189.62 195.74 270.43 287.00 295.27 322.50 322.88 323.08 595.29
 TOTAL COST C A G2 D THRIE E G1 THRIE B G4S G3
 VALUES 658.10 688.91 726.56 789.22 862.65 873.75 873.77 890.98 905.48 941.36 1504.21
 BENEFIT/COST C A D THRIE E G2 G4S B G4W G3 G1
 VALUES .82 .72 .64 .62 .60 .48 .46 .44 .40 .29 -.08

A. 47

-4 STATE COST
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST THRIE G3 C A D G4S E G4S G4W G4W G2 G1
 VALUES 134.82 170.09 172.62 181.85 254.47 270.15 279.75 302.87 304.27 304.64 595.24
 TOTAL COST C G2 D THRIE E B G1 G4S G4W G3
 VALUES 641.09 672.95 706.34 775.32 853.29 858.23 872.74 873.71 888.63 923.12 1488.56
 BENEFIT/COST C A G2 D THRIE E G4S B G4W G3 G1
 VALUES .85 .76 .67 .66 .61 .51 .49 .47 .43 .31 -.08

-6 STATE COST
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST THRIE G3 C A D G4S E G4S G4W G4W G2 G1
 VALUES 125.52 154.75 155.81 168.14 237.78 252.54 263.36 281.94 285.32 285.69 595.18
 TOTAL COST C G2 D THRIE E B G1 G4S G4W G3
 VALUES 624.28 656.26 685.42 761.61 841.84 843.99 853.80 871.02 873.66 904.17 1473.23
 BENEFIT/COST C A G2 D THRIE E G4S B G4W G3 G1
 VALUES .89 .80 .72 .68 .62 .54 .52 .51 .46 .32 -.08

-8 STATE COST
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST THRIE G3 C A D G4S E G4S G4W G4W G2 G1
 VALUES 116.24 139.38 139.87 154.70 220.24 234.04 245.94 260.23 265.62 265.98 595.12
 TOTAL COST C A G2 D THRIE E B G1 G4S G4W G3
 VALUES 607.86 638.71 663.71 748.18 824.42 834.10 834.72 852.51 873.60 884.46 1458.35
 BENEFIT/COST C A G2 D THRIE E G4S B G4W G3 G1
 VALUES .93 .84 .78 .71 .64 .57 .55 .54 .50 .33 -.08

2R-6-2

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 6-FT SHOULDER

2R-6-4

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 10 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 498.06

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	A	THRIE	G2	G3	C	E	B	G4W	G1
VALUES	146.14	148.13	160.16	161.18	166.39	179.28	188.04	191.59	210.48	210.89	502.31
TOTAL COST	G2	A	C	D	G4S	E	B	G1	G4W	THRIE	G3
VALUES	569.87	578.64	656.51	741.61	764.62	770.07	778.96	780.78	829.36	879.65	1497.75
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3	G1
VALUES	.82	.81	.66	.59	.57	.53	.51	.47	.46	.24	-.02
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	A	THRIE	G2	G3	C	E	B	G4W	G1
VALUES	141.48	144.13	155.42	156.30	158.52	173.53	181.87	184.64	204.26	204.67	499.71
TOTAL COST	G2	A	C	D	G4S	E	B	G1	G4W	THRIE	G3
VALUES	561.99	573.90	650.35	737.61	759.95	763.12	772.74	778.19	823.14	874.78	1492.01
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3	G1
VALUES	.84	.82	.67	.60	.58	.54	.52	.48	.47	.25	-.01
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	A	THRIE	G2	G3	C	E	B	G4W	G1
VALUES	136.71	140.15	149.91	150.26	151.01	167.42	175.23	177.67	197.71	198.11	496.92
TOTAL COST	G2	A	C	D	G4S	E	B	G1	G4W	THRIE	G3
VALUES	553.38	568.74	643.71	733.63	755.18	756.15	766.18	775.40	816.58	869.48	1485.89
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3	G1
VALUES	.86	.83	.69	.60	.58	.55	.53	.48	.48	.25	.00
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	A	THRIE	G2	G3	C	E	B	G4W	G1
VALUES	131.87	136.22	140.46	144.67	145.27	160.92	168.08	170.69	190.80	191.20	493.90
TOTAL COST	G2	A	C	D	E	G4S	B	G1	G4W	THRIE	G3
VALUES	543.93	563.15	636.56	729.70	749.16	750.35	759.28	772.38	809.67	863.74	1479.40
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3	G1
VALUES	.89	.84	.70	.61	.59	.57	.54	.50	.49	.26	.01
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	A	THRIE	G2	G3	C	E	B	G4W	G1
VALUES	127.03	130.10	132.42	138.68	139.12	154.07	160.42	163.69	183.54	183.93	490.63
TOTAL COST	G2	A	C	D	E	G4S	B	G1	G4W	THRIE	G3
VALUES	533.57	557.15	628.90	725.89	742.17	745.50	752.02	769.11	802.41	857.59	1472.55
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3	G1
VALUES	.91	.86	.72	.62	.60	.58	.55	.51	.50	.26	.03

A.48

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 6-FT SHOULDER

2R-6-4

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 10 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 498.06

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	A	THRIE	G3	C	B	G4W	G1
VALUES	118.84	122.23	128.78	132.34	132.63	146.94	152.29	156.71	175.97	487.07
TOTAL COST	G2	A	C	D	E	G4S	B	G1	THRIE	G3
VALUES	522.36	550.81	620.77	722.25	735.18	740.70	744.45	765.55	851.10	1465.42
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G3	G1
VALUES	.94	.87	.74	.62	.61	.59	.57	.52	.27	.04

-2 STATE COST	G1	G2	A	C	R	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	A	THRIE	G3	C	B	G4W	G1
VALUES	107.06	117.53	125.32	125.80	125.93	139.66	143.83	149.70	168.19	483.16
TOTAL COST	G2	A	C	D	E	G4S	B	G1	THRIE	G3
VALUES	510.54	544.27	612.31	718.80	728.18	736.01	736.66	761.64	844.41	1458.14
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G3	G1
VALUES	.97	.89	.76	.63	.62	.60	.58	.52	.27	.05

A.49

-4 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	G3	C	B	G4W	G1
VALUES	95.12	112.95	119.24	119.25	122.00	132.43	135.24	142.61	160.34	478.86
TOTAL COST	G2	A	C	D	E	B	G4S	G1	THRIE	G3
VALUES	498.59	537.73	603.72	715.48	721.08	728.82	731.43	757.34	837.72	1450.91
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G3	G1
VALUES	1.00	.91	.77	.63	.62	.61	.59	.53	.28	.07

-6 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	G3	C	B	G4W	G1
VALUES	83.62	108.43	112.71	112.87	118.67	125.42	126.71	135.30	152.56	474.11
TOTAL COST	G2	A	C	D	E	B	G4S	G1	THRIE	G3
VALUES	487.09	531.35	595.18	712.14	713.78	721.04	726.91	752.59	831.19	1443.89
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G3	G1
VALUES	1.03	.92	.79	.64	.63	.63	.61	.56	.28	.09

-8 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	C	G3	B	G4W	G1
VALUES	72.68	103.78	106.24	106.54	115.12	118.16	118.47	127.70	144.75	468.85
TOTAL COST	G2	A	C	E	D	B	G4S	G1	THRIE	G3
VALUES	476.15	525.02	586.63	706.18	708.60	713.23	722.26	747.32	824.72	1436.95
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G3	G1
VALUES	1.05	.94	.81	.65	.64	.64	.62	.57	.29	.10

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 6-FT SHOULDER

2R-6-6

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 434.21

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	C	B	G4W	G1
VALUES	69.93	145.34	147.14	154.84	161.51	165.80	174.29	181.98	201.86	202.26	351.16
TOTAL COST	G2	A	G1	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	473.41	584.27	624.63	650.46	733.99	740.66	763.82	770.33	820.74	873.32	1442.77
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1	G3
VALUES	.90	.64	.54	.48	.47	.47	.41	.39	.38	.30	.19
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	C	B	G4W	G1
VALUES	66.72	140.90	143.44	151.23	156.61	159.92	173.54	177.03	197.43	197.83	347.17
TOTAL COST	G2	A	G1	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	470.20	578.40	625.64	645.51	735.09	736.92	754.37	765.91	816.31	869.70	1492.01
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1	G3
VALUES	.91	.66	.55	.49	.48	.47	.42	.39	.38	.31	.20
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	C	B	G4W	G1
VALUES	63.60	136.28	139.64	147.17	151.65	153.66	167.42	171.59	192.57	192.97	342.57
TOTAL COST	G2	A	G1	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	467.08	572.13	621.04	640.06	730.13	733.12	754.76	761.05	811.44	865.65	1485.84
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1	G3
VALUES	.92	.67	.56	.50	.49	.48	.43	.40	.39	.33	.20
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	C	B	G4W	G1
VALUES	60.64	131.55	135.84	142.60	146.69	147.04	160.42	165.55	187.19	187.59	337.26
TOTAL COST	G2	A	G1	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	444.12	565.51	615.73	634.02	725.17	729.31	750.02	755.67	806.06	861.08	1479.40
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1	G3
VALUES	.93	.69	.57	.50	.50	.49	.43	.41	.40	.35	.21
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	C	B	G4W	G1
VALUES	57.90	126.75	132.11	137.46	140.14	141.79	154.07	158.84	181.23	181.62	331.11
TOTAL COST	G2	A	G1	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	461.37	558.62	609.59	627.32	720.27	725.59	745.23	749.71	800.10	855.93	1472.55
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1	G3
VALUES	.93	.70	.59	.51	.51	.50	.45	.41	.41	.37	.21

A.50

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 6-FT SHOULDER

2R-6-6

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 434.21

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	A	E	G3	C	B	G4W	G1
VALUES	55.44	122.00	128.53	131.75	133.11	137.01	146.94	151.46	174.67	175.06	324.03
TOTAL COST	G2	A	G1	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	458.91	551.59	602.51	619.94	715.49	722.01	740.47	743.15	793.53	850.23	1465.42
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1	G3
VALUES	.94	.72	.60	.52	.51	.50	.46	.42	.42	.40	.22
-2											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	A	E	G3	C	B	G4W	G1
VALUES	53.30	117.35	125.14	125.57	126.12	132.37	139.66	143.49	167.57	167.95	315.92
TOTAL COST	G2	A	G1	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	456.78	544.59	594.40	611.97	710.85	718.61	735.82	736.04	786.42	844.05	1458.14
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1	G3
VALUES	.94	.74	.62	.52	.52	.51	.47	.43	.43	.42	.22
-4											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	E	G3	C	B	G4W	G1
VALUES	51.45	112.83	119.14	119.34	121.87	127.79	132.43	135.14	160.10	160.47	306.74
TOTAL COST	G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	454.92	537.82	585.21	603.62	706.27	715.35	728.57	731.30	778.95	837.61	1450.91
BENEFIT/COST	G2	A	C	E	D	G4S	B	G1	G4W	THRIE	G3
VALUES	.95	.75	.64	.53	.53	.52	.48	.46	.44	.44	.23
-6											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	E	G3	C	B	G4W	G1
VALUES	49.77	108.36	112.70	112.88	118.60	123.12	125.42	126.69	152.48	152.85	296.43
TOTAL COST	G2	A	G1	C	E	D	B	G4W	G4W	THRIE	G3
VALUES	453.24	531.36	574.90	595.17	701.60	712.07	720.95	726.94	771.32	831.18	1443.89
BENEFIT/COST	G2	A	C	E	D	G4S	B	G1	G4W	THRIE	G3
VALUES	.95	.77	.66	.54	.53	.53	.50	.49	.45	.45	.23
-8											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	E	G3	C	B	G4W	G1
VALUES	48.12	103.75	106.24	106.54	115.09	118.16	118.19	118.47	144.72	145.09	284.82
TOTAL COST	G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	451.60	525.02	563.30	586.63	696.66	708.57	713.20	722.23	763.56	824.72	1436.95
BENEFIT/COST	G2	A	C	E	D	G1	G4S	B	G4W	THRIE	G3
VALUES	.96	.78	.67	.55	.54	.54	.53	.51	.47	.46	.24

A.51

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 6-FT SHOULDER

2R-6-8

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 380.06

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1 2 3 4 5 6 7 8 9 10 11

10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G1	G3	C	B	G4W
VALUES	66.93	139.50	141.13	154.84	156.05	165.76	173.99	176.40	182.02	201.82	202.23
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	452.47	470.40	584.23	650.50	734.53	734.61	757.97	770.29	820.70	873.32	1444.87
BENEFIT/COST	G2	G1	A	C	D	G4S	E	B	THRIE	G4W	G3
VALUES	.78	.74	.51	.42	.40	.39	.39	.31	.29	.15	

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G1	G3	C	B	G4W
VALUES	64.40	136.23	138.60	151.23	152.26	159.91	165.97	171.29	177.05	197.41	197.82
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	444.45	467.87	578.38	645.53	730.73	732.08	754.70	765.84	816.29	869.70	1489.77
BENEFIT/COST	G2	G1	A	C	D	G4S	E	B	THRIE	G4W	G3
VALUES	.78	.77	.53	.43	.41	.39	.39	.32	.29	.16	

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G1	G3	C	B	G4W
VALUES	61.87	136.76	135.99	147.17	148.38	153.65	157.27	165.74	171.59	192.56	192.96
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	435.75	465.35	572.13	640.07	726.86	729.47	751.24	761.04	811.44	865.65	1484.22
BENEFIT/COST	G2	G1	A	C	D	E	G4S	B	THRIE	G4W	G3
VALUES	.80	.79	.54	.44	.41	.40	.40	.33	.30	.16	

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G1	G3	C	B	G4W
VALUES	59.40	129.10	133.30	142.60	144.42	147.04	147.78	159.72	165.55	187.19	187.59
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	426.26	462.88	565.51	634.02	722.89	726.77	747.57	755.67	806.06	861.08	1478.20
BENEFIT/COST	G2	G1	A	C	D	E	G4S	B	THRIE	G4W	G3
VALUES	.83	.79	.56	.46	.42	.41	.41	.34	.31	.17	

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G1	G3	C	B	G4W
VALUES	57.06	125.23	130.53	137.45	137.46	140.14	140.38	153.26	158.84	181.23	181.62
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	415.92	460.53	558.62	627.32	718.86	724.01	743.71	749.71	800.10	855.93	1471.74
BENEFIT/COST	G2	G1	A	C	D	E	G4S	B	THRIE	G4W	G3
VALUES	.87	.80	.57	.47	.42	.41	.41	.35	.34	.32	.17

A.52

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 6-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 380.06

AAOT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	G1	D	THRIE	A	E	G3	C	B	G4W
	VALUES	54.91	121.19	126.33	127.70	131.75	133.11	136.27	146.43	151.46	174.67	175.06
	TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	404.80	458.38	551.59	619.44	714.74	721.17	739.67	743.15	793.53	850.23	1464.90
	BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G4W	G3
	VALUES	.91	.81	.59	.49	.43	.42	.42	.36	.35	.33	.18

-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	A	E	G3	C	B	G4W
	VALUES	52.99	114.67	117.02	124.79	125.57	126.12	132.06	139.36	143.49	167.57	167.95
	TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	393.14	456.46	544.59	611.97	710.54	718.27	735.49	736.04	786.42	844.05	1457.84
	BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G4W	G3
	VALUES	.95	.81	.61	.50	.43	.43	.43	.37	.35	.34	.18

-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	A	E	G3	C	B	G4W
	VALUES	51.28	102.95	112.73	119.14	119.34	121.78	127.71	132.28	135.14	150.10	160.47
	TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	381.42	454.76	537.82	603.62	706.18	715.25	728.57	731.21	778.95	837.61	1450.75
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
	VALUES	1.00	.81	.62	.52	.44	.44	.43	.39	.36	.36	.19

-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	A	E	G3	C	B	G4W
	VALUES	49.69	91.73	108.35	112.70	112.88	118.58	123.11	125.34	126.69	152.48	152.85
	TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	370.21	453.17	531.36	595.17	701.59	712.06	720.95	726.83	771.32	831.18	1443.82
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
	VALUES	1.04	.82	.64	.54	.44	.44	.44	.40	.37	.37	.19

-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	A	E	G3	C	B	G4W
	VALUES	48.10	81.12	103.75	106.24	106.54	115.09	118.16	118.19	118.45	144.72	145.09
	TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	359.60	451.57	525.02	586.63	696.66	708.57	713.20	722.23	763.56	824.72	1436.92
	BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
	VALUES	1.07	.82	.65	.56	.45	.45	.45	.41	.38	.38	.20

A.53

2R-6-8

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 6-FT SHOULDER

2R-6-10

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 334.21

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
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10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	60.56	108.04	139.46	141.09	154.84	156.05	165.76	176.40	182.02	201.82	202.23
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	386.51	464.04	584.23	650.50	734.53	734.57	757.93	770.29	820.70	873.32	1444.87
BENEFIT/COST	G1	G2	A	D	C	G4S	E	THRIE	B	G4W	G3
VALUES	.81	.68	.40	.33	.32	.31	.31	.25	.23	.21	.12

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	59.31	102.64	136.21	138.59	151.23	152.26	159.91	171.29	177.05	197.41	197.82
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	381.11	462.78	578.38	645.53	730.73	732.06	754.69	765.89	816.29	869.70	1489.77
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.83	.68	.42	.34	.33	.32	.31	.25	.24	.22	.12

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	58.03	97.33	132.76	135.99	147.17	148.38	153.65	165.74	171.59	192.56	192.96
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	375.81	461.51	572.13	640.07	726.86	729.46	751.23	761.04	811.44	865.65	1484.22
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.85	.68	.43	.35	.33	.33	.32	.26	.25	.23	.13

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	56.73	92.17	129.09	133.30	142.60	144.42	147.04	159.72	165.55	187.19	187.59
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	370.65	460.21	565.51	634.02	722.89	726.77	747.57	755.67	806.06	861.08	1478.20
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.87	.69	.45	.36	.34	.33	.33	.27	.26	.24	.13

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	55.40	87.22	125.23	130.53	137.46	140.14	140.38	153.26	158.84	181.23	181.62
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	365.69	458.87	558.62	627.32	718.86	724.01	743.71	749.71	800.10	855.93	1471.74
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.89	.69	.46	.37	.34	.34	.34	.27	.27	.25	.14

A.54

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 6-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 334.21
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1	2	3	4	5	6	7	8	9	10	11
0	G1	G2	A	C	B	E	D	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	A	E	G3	B	G4W
VALUES	54.03	82.54	121.19	127.70	131.75	133.11	136.27	146.43	151.46	174.67
TOTAL COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	361.02	452.51	551.59	619.94	714.74	721.17	739.67	743.15	793.53	850.23
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G3
VALUES	.90	.69	.48	.39	.35	.34	.34	.28	.26	.14

-2	G1	G2	A	C	B	E	D	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	A	E	G3	B	G4W
VALUES	52.63	78.17	117.02	124.79	125.57	126.12	132.06	139.36	143.44	167.57
TOTAL COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	356.65	456.10	544.59	611.97	710.54	718.27	735.49	736.04	786.42	844.05
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	G4W	G3
VALUES	.92	.70	.50	.41	.35	.35	.35	.29	.27	.15

A.55

-4	G1	G2	A	C	B	E	D	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	G3	B	G4W
VALUES	51.18	74.06	112.73	119.14	119.34	121.78	127.71	132.28	135.14	160.47
TOTAL COST	G1	G2	A	C	E	D	B	G4S	THRIE	G3
VALUES	352.54	454.66	537.82	603.62	706.18	715.25	728.57	731.21	778.95	837.61
BENEFIT/COST	G1	G2	A	C	G4S	D	E	B	THRIE	G3
VALUES	.93	.70	.51	.42	.36	.36	.36	.31	.28	.15

-6	G1	G2	A	C	B	E	D	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	G3	B	G4W
VALUES	49.68	70.10	108.35	112.70	112.88	118.58	123.11	125.34	126.64	152.85
TOTAL COST	G1	G2	A	C	E	D	B	G4S	THRIE	G3
VALUES	348.57	453.15	531.36	595.17	701.59	712.06	720.95	726.83	771.32	831.18
BENEFIT/COST	G1	G2	A	C	G4S	E	D	B	THRIE	G3
VALUES	.95	.71	.53	.44	.37	.36	.36	.32	.29	.16

-8	G1	G2	A	C	B	E	D	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	D	C	E	B	G4W
VALUES	48.09	66.17	103.75	106.24	106.54	115.09	118.16	118.19	118.45	144.72
TOTAL COST	G1	G2	A	C	E	D	B	G4S	THRIE	G3
VALUES	344.65	451.57	525.02	586.63	696.66	708.57	713.20	722.23	763.56	824.72
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G3
VALUES	.96	.71	.54	.46	.37	.37	.37	.33	.31	.16

2R-6-10

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 6-FT SHOULDER

2R-6-12

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 18 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 295.43

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
	VALUES	60.56	69.08	139.46	141.09	154.84	156.05	165.76	170.24	182.02	201.82	202.23
	TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	347.56	464.04	584.23	650.50	734.53	734.57	757.93	770.29	820.70	873.32	1488.72
	BENEFIT/COST	G1	G2	A	D	G4S	C	E	THRIE	B	G4W	G3
	VALUES	.81	.58	.31	.26	.25	.24	.24	.20	.16	.15	.09

8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
	VALUES	59.31	66.39	136.21	138.59	151.23	152.26	159.91	166.37	177.05	197.41	197.82
	TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	344.87	462.78	578.38	645.53	730.73	732.06	754.69	765.89	816.29	869.70	1484.85
	BENEFIT/COST	G1	G2	A	D	G4S	C	E	THRIE	B	G4W	G3
	VALUES	.82	.59	.32	.26	.26	.25	.25	.20	.17	.16	.10

6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
	VALUES	58.03	63.84	132.76	135.99	147.17	148.38	153.65	162.03	171.59	192.56	192.96
	TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	342.31	461.51	572.13	640.07	726.86	729.46	751.23	761.04	811.44	865.65	1480.51
	BENEFIT/COST	G1	G2	A	D	C	G4S	E	THRIE	B	G4W	G3
	VALUES	.83	.59	.34	.27	.26	.26	.25	.21	.18	.17	.10

4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
	VALUES	56.73	61.49	129.09	133.30	142.60	144.42	147.04	157.14	165.55	187.19	187.59
	TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	339.97	460.21	565.51	634.02	722.89	726.77	747.57	755.67	806.06	861.08	1475.62
	BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
	VALUES	.84	.59	.35	.28	.27	.27	.26	.21	.19	.17	.10

2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	A	E	G3	C	B	G4W
	VALUES	55.40	59.44	125.23	130.53	137.46	140.14	140.38	151.66	158.84	181.23	181.62
	TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	337.92	458.87	558.62	627.32	718.86	724.01	743.71	749.71	800.10	855.93	1470.13
	BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
	VALUES	.85	.59	.37	.29	.28	.28	.27	.22	.20	.18	.11

A.56

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 6-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 18 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 295.43

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	A	E	G3	C	B	G4W
VALUES	54.03	57.75	121.14	127.70	131.75	133.11	136.27	145.58	151.46	174.67	175.06
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	336.23	457.51	551.54	619.94	714.74	721.17	739.67	743.15	793.53	850.23	1464.06
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.85	.60	.39	.31	.28	.28	.28	.23	.21	.19	.11
-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	A	E	G3	C	B	G4W
VALUES	52.63	56.47	117.02	124.79	125.57	126.12	132.06	139.01	143.49	167.57	167.95
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	334.94	456.10	544.54	611.97	710.54	718.27	735.49	736.04	786.42	844.05	1457.49
BENEFIT/COST	G1	G2	A	C	G4S	D	E	THRIE	B	G4W	G3
VALUES	.86	.60	.40	.32	.29	.29	.28	.24	.22	.21	.12
-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	G3	C	B	G4W
VALUES	51.18	55.54	112.73	119.14	119.34	121.78	127.71	132.18	135.14	160.10	160.47
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	334.02	454.66	537.82	603.62	706.18	715.25	728.57	731.21	778.95	837.61	1450.65
BENEFIT/COST	G1	G2	A	C	G4S	D	E	THRIE	B	G4W	G3
VALUES	.86	.61	.42	.34	.30	.29	.29	.25	.24	.22	.12
-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	G3	C	B	G4W
VALUES	49.68	54.85	108.35	112.70	112.88	118.58	123.11	125.33	126.69	152.48	152.85
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	333.33	453.15	531.36	595.17	701.59	712.06	720.95	726.83	771.32	831.18	1443.80
BENEFIT/COST	G1	G2	A	C	G4S	D	E	THRIE	B	G4W	G3
VALUES	.86	.61	.44	.36	.30	.30	.30	.25	.25	.23	.13
-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	E	G3	B	G4W
VALUES	48.09	54.23	103.75	106.24	106.54	115.09	118.16	118.19	118.44	144.72	145.04
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	332.71	451.57	525.02	586.63	696.66	708.57	713.20	722.23	763.56	826.72	1436.92
BENEFIT/COST	G1	G2	A	C	G4S	E	D	B	THRIE	G4W	G3
VALUES	.87	.61	.45	.38	.31	.31	.30	.27	.26	.24	.13

A.57

2R-6-12

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 7 FT

2R-7-0

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 7 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 219.33

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	A	E	G2	G3	C	B	G4W	G1
VALUES	141.93	142.83	150.50	155.62	158.64	166.65	175.35	185.17	202.78	203.16	371.31
TOTAL COST	G2	A	G1	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	570.12	574.10	644.78	653.65	736.30	737.17	760.41	771.25	821.64	868.47	1493.83
BENEFIT/COST	A	G2	D	G4S	E	THRIE	C	G3	B	G4W	G1
VALUES	.15	.13	.13	.13	.10	.07	.10	.03	.03	.03	-.55

STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	A	E	G2	G3	C	B	G4W	G1
VALUES	137.82	139.29	147.47	151.39	153.76	159.13	170.13	179.42	197.54	197.92	366.68
TOTAL COST	G2	A	G1	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	562.61	569.86	645.16	647.90	732.24	732.76	750.29	766.01	816.39	855.94	1488.60
BENEFIT/COST	A	G2	D	G4S	E	THRIE	C	B	G3	G4W	G1
VALUES	.16	.15	.13	.13	.11	.10	.09	.04	.04	.03	-.53

STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	A	E	G2	G3	C	B	G4W	G1
VALUES	133.55	135.71	144.05	146.78	148.82	150.48	164.57	173.26	191.95	192.33	361.58
TOTAL COST	G2	A	G1	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	554.46	565.25	640.05	641.74	727.30	729.18	752.03	760.43	810.80	862.53	1483.05
BENEFIT/COST	A	G2	D	G4S	E	THRIE	C	B	G4W	G3	G1
VALUES	.17	.17	.14	.14	.12	.10	.10	.05	.04	.04	-.51

STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	A	E	G2	G3	C	B	G4W	G1
VALUES	129.16	132.12	140.15	141.75	142.05	143.90	158.65	166.64	185.47	186.34	355.87
TOTAL COST	G2	A	G1	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	545.53	560.23	634.35	635.12	722.38	725.60	747.63	754.44	804.82	858.63	1477.12
BENEFIT/COST	A	G2	D	G4S	E	THRIE	C	B	G4W	G3	G1
VALUES	.19	.19	.15	.15	.13	.11	.11	.06	.05	.05	-.49

STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	A	E	G2	G3	C	B	G4W	G1
VALUES	124.68	128.60	132.21	135.67	136.27	139.07	152.33	159.51	174.55	174.92	344.45
TOTAL COST	G2	A	G1	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	535.69	554.75	627.92	627.98	717.55	722.08	733.16	748.03	798.40	854.15	1470.80
BENEFIT/COST	A	G2	D	G4S	E	THRIE	C	B	G4W	G3	G1
VALUES	.22	.20	.15	.15	.14	.12	.12	.07	.06	.05	-.47

A.58

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 7 FT

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 7 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 219.33
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
1	2	3	4	5	6	7	8	9	10	11
0 STATE COST										
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	A	THRIE	E	G3	C	B	G4W	G1
VALUES	120.21	121.37	125.22	130.36	130.54	134.41	145.62	151.85	172.70	342.15
TOTAL COST	G2	A	C	G1	E	D	G4S	B	THRIE	G3
VALUES	524.84	548.83	620.32	620.63	712.89	718.70	738.68	741.17	849.02	1464.10
BENEFIT/COST	G2	A	G4S	D	E	C	THRIE	B	G4W	G1
VALUES	.24	.21	.16	.16	.15	.14	.12	.08	.07	-.44
-2 STATE COST										
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	A	THRIE	E	G3	C	B	G1
VALUES	104.58	115.74	125.05	124.06	124.76	129.95	138.59	143.71	165.44	333.86
TOTAL COST	G2	A	C	G1	E	D	B	G4S	THRIE	G3
VALUES	513.05	542.53	612.18	612.34	708.43	715.52	733.91	734.27	843.23	1457.07
BENEFIT/COST	G2	A	G4S	D	C	E	THRIE	B	G4W	G1
VALUES	.27	.23	.17	.16	.16	.15	.13	.09	.06	-.41
-4 STATE COST										
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	THRIE	D	E	G3	C	B	G1
VALUES	97.15	111.48	117.52	118.46	119.06	125.67	131.38	135.22	157.87	324.48
TOTAL COST	G2	A	G1	C	E	D	H	G4S	THRIE	G3
VALUES	500.63	536.00	602.95	603.69	704.15	712.53	726.35	729.96	836.93	1449.85
BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G1
VALUES	.30	.24	.18	.17	.17	.16	.14	.11	.10	-.38
-6 STATE COST										
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	THRIE	D	E	G3	C	B	G1
VALUES	84.74	107.24	110.99	111.94	116.13	121.40	124.21	126.61	150.19	313.96
TOTAL COST	G2	A	G1	C	E	D	B	G4S	THRIE	G3
VALUES	488.22	524.46	542.43	545.09	699.88	709.60	718.67	725.72	830.41	1442.68
BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G1
VALUES	.33	.26	.20	.18	.17	.17	.15	.12	.11	-.34
-8 STATE COST										
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	THRIE	D	E	G3	C	B	G1
VALUES	72.97	102.94	104.61	105.46	113.05	116.92	117.23	118.09	142.52	302.23
TOTAL COST	G2	A	G1	C	E	D	R	G4S	THRIE	G3
VALUES	476.45	523.08	580.71	586.56	695.40	706.52	711.00	721.42	823.94	1435.71
BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G1
VALUES	.36	.27	.22	.19	.18	.18	.16	.14	.12	-.30

A.59

2R-7-0

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 7-FT SHOULDER

2R-7-2

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 9 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 534.10

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

10	STATE COST	G1	G2	A	C	B	D	E	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	D	C	A	G4S	E	B	G4W	G2	G1	G1
VALUES	191.87	255.60	260.14	266.95	324.66	351.25	352.58	387.87	388.25	403.35	554.61	554.61
TOTAL COST	C	A	G2	G1	D	THRIE	E	B	G4S	G4W	G3	G3
VALUES	735.43	743.14	806.82	833.08	853.61	910.34	931.05	956.34	969.73	1006.73	1574.07	1574.07
BENEFIT/COST	C	A	THRIE	D	G2	E	G4S	B	G4W	G3	G1	G1
VALUES	.57	.50	.48	.46	.32	.31	.30	.26	.24	.21	.21	-.07

8	STATE COST	G1	G2	A	C	B	D	E	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	D	C	A	G4S	E	B	G4W	G2	G1	G1
VALUES	184.97	247.37	252.12	257.73	318.77	343.83	345.67	380.61	380.99	394.91	554.56	554.56
TOTAL COST	C	A	G2	G1	D	THRIE	E	B	G4S	G4W	G3	G3
VALUES	726.20	737.25	788.38	833.03	845.60	903.44	924.15	949.08	962.30	999.46	1565.84	1565.84
BENEFIT/COST	C	A	THRIE	D	G2	E	G4S	B	G4W	G3	G1	G1
VALUES	.59	.51	.49	.48	.34	.33	.31	.27	.25	.22	.22	-.07

6	STATE COST	G1	G2	A	C	B	D	E	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	D	C	A	G4S	E	B	G4W	G2	G1	G1
VALUES	177.75	238.20	243.37	247.55	311.81	335.40	337.89	372.17	372.55	385.18	554.51	554.51
TOTAL COST	C	A	G2	G1	D	THRIE	E	B	G4S	G4W	G3	G3
VALUES	716.03	730.29	788.66	832.98	836.85	886.23	916.36	940.65	953.87	991.03	1556.68	1556.68
BENEFIT/COST	C	A	THRIE	D	G2	E	G4S	B	G4W	G3	G1	G1
VALUES	.61	.53	.50	.49	.37	.34	.32	.28	.26	.22	.22	-.07

4	STATE COST	G1	G2	A	C	B	D	E	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	D	C	A	G4S	E	B	G4W	G2	G1	G1
VALUES	170.15	227.89	233.70	236.20	303.56	325.76	329.04	362.31	362.69	373.91	554.46	554.46
TOTAL COST	C	A	G2	D	G1	THRIE	E	B	G4S	G4W	G3	G3
VALUES	704.69	722.03	777.39	827.18	832.94	888.63	907.52	930.79	944.24	981.16	1546.36	1546.36
BENEFIT/COST	C	A	THRIE	D	G2	E	G4S	B	G4W	G3	G1	G1
VALUES	.64	.55	.51	.51	.40	.35	.34	.30	.28	.23	.23	-.07

2	STATE COST	G1	G2	A	C	B	D	E	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	D	C	A	G4S	E	B	G4W	G2	G1	G1
VALUES	162.11	216.19	222.94	223.43	293.77	314.70	318.46	350.75	351.12	360.83	554.42	554.42
TOTAL COST	C	A	G2	D	G1	THRIE	E	B	G4S	G4W	G3	G3
VALUES	691.90	712.25	764.31	816.42	832.89	880.58	897.43	919.22	933.18	969.60	1534.67	1534.67
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1	G1
VALUES	.66	.57	.52	.52	.43	.37	.35	.32	.30	.24	.24	-.07

A.60

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 7-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 9 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 534.10
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1	2	3	4	5	6	7	8	9	10	11
0	G1	G2	A	C	B	E	D	G4W	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48
SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	B	G4W	G1
VALUES	153.59	202.94	209.04	210.96	282.26	302.05	307.46	337.25	337.61	345.71
TOTAL COST	C	A	G2	D	G1	THRIE	E	B	G4S	G3
VALUES	677.52	700.73	749.19	804.44	832.85	872.07	885.94	905.72	920.53	956.09
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3
VALUES	.69	.60	.54	.53	.47	.39	.38	.35	.32	.25
										-.07
-2	G1	G2	A	C	B	E	D	G4W	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48
SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	B	G4W	G1
VALUES	144.61	188.15	193.04	197.78	258.95	287.74	294.48	321.73	322.09	328.49
TOTAL COST	C	A	G2	D	G1	THRIE	E	B	G4S	G3
VALUES	661.52	687.42	731.96	791.25	832.81	863.09	872.96	890.20	906.21	940.57
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3
VALUES	.73	.63	.57	.54	.51	.41	.40	.37	.34	.26
										-.07
-4	G1	G2	A	C	B	E	D	G4W	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48
SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	B	G4W	G1
VALUES	135.30	172.23	175.82	183.69	254.04	271.93	280.12	304.43	304.79	304.43
TOTAL COST	C	A	G2	D	G1	THRIE	E	B	G4S	G3
VALUES	644.29	672.52	712.90	777.16	832.77	853.77	858.59	872.91	890.41	923.26
BENEFIT/COST	C	A	D	G2	THRIE	E	G4S	B	G4W	G3
VALUES	.76	.67	.59	.56	.56	.44	.42	.40	.37	.27
										-.07
-6	G1	G2	A	C	B	E	D	G4W	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48
SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	B	G4W	G1
VALUES	125.88	156.02	158.20	169.34	238.04	255.06	264.67	285.98	286.34	289.18
TOTAL COST	C	A	G2	D	G1	THRIE	E	B	G4S	G3
VALUES	626.68	656.51	692.65	762.81	832.74	843.15	844.35	854.46	873.53	904.81
BENEFIT/COST	C	A	D	G2	THRIE	E	G4S	B	G4W	G3
VALUES	.80	.71	.61	.61	.57	.47	.45	.44	.40	.29
										-.07
-8	G1	G2	A	C	B	E	D	G4W	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48
SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	B	G4W	G1
VALUES	116.56	140.39	141.07	155.37	221.38	237.49	248.38	266.97	267.31	268.32
TOTAL COST	C	A	G2	D	E	G1	THRIE	B	G4S	G3
VALUES	609.54	639.86	671.79	748.85	826.85	832.70	835.04	835.45	855.46	885.79
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3
VALUES	.84	.75	.66	.64	.58	.49	.48	.47	.43	.30
										-.07

A.61

2R-7-2

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 7-FT SHOULDER

2R-7-4

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 11 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 464.83

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48
SOCIETAL COST	G4S	D	A	THRIE	G2	G3	C	E	B	G1
VALUES	143.20	144.24	155.62	152.30	166.65	175.35	185.17	191.22	206.16	206.54
TOTAL COST	G2	A	C	D	G1	G4S	E	B	G4W	THRIE
VALUES	570.12	574.10	653.65	732.71	756.90	761.67	769.69	774.63	825.02	875.78
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3
VALUES	.74	.74	.60	.54	.52	.47	.46	.43	.42	.22
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48
SOCIETAL COST	G4S	D	A	THRIE	G2	G3	C	E	B	G1
VALUES	138.78	140.37	151.94	153.01	159.13	170.13	179.42	183.87	200.22	200.60
TOTAL COST	G2	A	C	D	G1	G4S	E	B	G4W	THRIE
VALUES	562.61	569.86	647.90	733.85	754.81	757.26	762.34	768.70	819.08	871.49
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3
VALUES	.76	.75	.61	.55	.53	.49	.47	.43	.43	.22
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48
SOCIETAL COST	G4S	D	A	THRIE	G2	G3	C	E	B	G1
VALUES	134.24	136.54	146.78	148.34	150.98	164.57	173.26	176.57	194.01	194.39
TOTAL COST	G2	A	C	D	G1	G4S	E	B	G4W	THRIE
VALUES	554.46	565.25	641.74	730.01	752.54	752.76	755.05	762.49	812.87	866.81
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3
VALUES	.78	.76	.62	.55	.53	.50	.48	.44	.44	.23
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48
SOCIETAL COST	G4S	D	A	THRIE	G2	G3	C	E	B	G1
VALUES	129.72	132.76	141.75	142.05	143.23	158.65	166.64	169.35	187.49	187.86
TOTAL COST	G2	A	C	D	E	G4S	G1	B	G4W	THRIE
VALUES	545.53	560.23	635.12	726.23	747.82	748.20	750.08	755.96	806.34	861.71
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3
VALUES	.80	.77	.64	.56	.54	.51	.49	.45	.45	.23
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48
SOCIETAL COST	G4S	D	A	THRIE	G2	G3	C	E	B	G1
VALUES	125.14	129.10	132.21	136.27	137.66	152.33	159.51	162.22	180.62	180.99
TOTAL COST	G2	A	C	D	E	G4S	G1	B	G4W	THRIE
VALUES	535.69	554.75	627.98	722.57	740.70	743.61	747.40	749.09	799.46	856.14
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3
VALUES	.82	.79	.65	.57	.55	.52	.50	.46	.46	.24
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48
SOCIETAL COST	G4S	D	A	THRIE	G2	G3	C	E	B	G1
VALUES	125.14	129.10	132.21	136.27	137.66	152.33	159.51	162.22	180.62	180.99
TOTAL COST	G2	A	C	D	E	G4S	G1	B	G4W	THRIE
VALUES	535.69	554.75	627.98	722.57	740.70	743.61	747.40	749.09	799.46	856.14
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3
VALUES	.82	.79	.65	.57	.55	.52	.50	.46	.46	.24

A.62

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 7-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 11 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 464.83
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

0 STATE COST
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST
 VALUES 120.57 121.37 125.61 130.36 131.65 145.62 151.85 155.22 173.40 173.76 465.98
 TOTAL COST
 VALUES 524.84 548.83 620.32 719.08 733.70 739.05 741.87 744.46 792.24 850.13 1484.10
 BENEFIT/COST
 VALUES .85 .80 .67 .57 .56 .54 .51 .47 .46 .24 -.00

-2 STATE COST
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST
 VALUES 109.58 116.08 122.34 124.06 125.25 138.59 143.71 148.35 165.86 166.23 462.74
 TOTAL COST
 VALUES 513.05 542.53 612.18 715.81 726.83 734.34 734.55 741.21 784.70 843.72 1457.07
 BENEFIT/COST
 VALUES .88 .81 .69 .58 .56 .55 .53 .48 .47 .25 .01

A.63

-4 STATE COST
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST
 VALUES 97.15 111.68 117.52 118.61 119.25 131.38 135.22 141.54 158.11 158.47 459.13
 TOTAL COST
 VALUES 500.63 536.00 603.69 712.73 720.01 726.59 730.16 737.60 776.94 837.08 1449.85
 BENEFIT/COST
 VALUES .91 .83 .70 .58 .57 .56 .54 .50 .48 .25 .02

-6 STATE COST
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST
 VALUES 84.74 107.35 110.99 111.96 116.24 124.21 126.61 134.64 150.31 150.66 455.09
 TOTAL COST
 VALUES 488.22 529.46 595.09 709.71 713.11 718.78 725.83 733.56 769.13 830.44 1442.68
 BENEFIT/COST
 VALUES .94 .85 .72 .59 .58 .57 .55 .51 .49 .26 .03

-8 STATE COST
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST
 VALUES 72.97 102.99 104.61 105.47 113.10 117.23 118.09 127.48 142.57 142.91 450.54
 TOTAL COST
 VALUES 476.45 523.08 586.56 705.96 706.57 711.04 721.47 729.02 761.39 823.94 1435.71
 BENEFIT/COST
 VALUES .97 .86 .74 .59 .59 .58 .57 .52 .50 .26 .05

2R-7-4

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 7-FT SHOULDER

2R-7-6

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 13 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 406.01

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10	STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4S 618.48	THRIE 718.48	G3 1318.48
	SOCIETAL COST VALUES	G2 69.02	G4S 141.93	D 142.83	THRIE 150.50	E 158.69	A 161.69	G3 175.37	B 178.65	G4W 196.87	G1 333.78
	TOTAL COST VALUES	G2 472.49	A 580.17	G1 612.25	C 647.13	D 736.30	E 737.17	B 760.41	G4S 815.34	THRIE 868.97	G3 1493.85
	BENEFIT/COST VALUES	.84	.58	.49	.44	.43	.43	.37	.36	.26	.17
8	STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4S 618.48	THRIE 718.48	G3 1318.48
	SOCIETAL COST VALUES	G2 65.67	G4S 137.82	D 139.29	THRIE 147.47	E 153.76	A 156.31	G3 170.14	C 174.12	G4W 192.81	G1 330.69
	TOTAL COST VALUES	G2 469.15	A 574.79	G1 609.17	C 642.60	D 732.24	E 737.76	B 756.29	G4S 811.28	THRIE 865.94	G3 1488.61
	BENEFIT/COST VALUES	.84	.60	.49	.45	.44	.43	.38	.36	.27	.18
6	STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4S 618.48	THRIE 718.48	G3 1318.48
	SOCIETAL COST VALUES	G2 62.43	G4S 133.55	D 135.71	THRIE 144.05	E 148.82	A 150.58	G3 164.58	C 169.18	G4W 188.01	G1 327.12
	TOTAL COST VALUES	G2 465.90	A 569.05	G1 605.59	C 637.66	D 727.30	E 729.18	B 752.03	G4S 806.86	THRIE 862.53	G3 1483.05
	BENEFIT/COST VALUES	.85	.61	.51	.46	.44	.44	.38	.36	.28	.18
4	STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4S 618.48	THRIE 718.48	G3 1318.48
	SOCIETAL COST VALUES	G2 59.33	G4S 129.16	D 132.12	THRIE 140.15	E 143.90	A 144.48	G3 158.65	C 163.71	G4W 183.14	G1 322.95
	TOTAL COST VALUES	G2 462.81	A 562.95	G1 601.42	C 632.19	D 722.38	E 725.60	B 747.63	G4S 801.99	THRIE 858.63	G3 1477.13
	BENEFIT/COST VALUES	.86	.62	.52	.46	.45	.45	.39	.37	.30	.19
2	STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4S 618.48	THRIE 718.48	G3 1318.48
	SOCIETAL COST VALUES	G2 56.44	G4S 124.68	D 128.60	THRIE 135.67	E 138.04	A 139.07	G3 152.33	C 157.61	G4W 172.72	G1 318.06
	TOTAL COST VALUES	G2 459.92	A 556.51	G1 596.53	C 626.09	D 717.55	E 722.08	B 743.16	G4S 796.57	THRIE 854.15	G3 1470.80
	BENEFIT/COST VALUES	.87	.64	.53	.47	.46	.45	.40	.38	.32	.19

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 7-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 13 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 406.01
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	A	E	G3	C	B	G4W	G1
VALUES	53.85	120.21	125.22	130.54	131.34	134.41	145.62	150.79	171.68	172.05	312.32
TOTAL COST	G2	A	G1	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	457.32	544.81	580.80	619.27	712.89	718.70	738.68	740.15	790.52	849.02	1464.10
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1	G3
VALUES	.87	.66	.54	.47	.47	.47	.46	.41	.38	.34	.20

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	A	E	G3	C	B	G4W	G1
VALUES	51.60	115.79	122.05	124.49	124.76	129.95	138.59	143.24	164.98	165.35	305.61
TOTAL COST	G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	455.07	542.47	588.09	611.71	708.43	715.52	733.46	734.27	783.82	843.23	1457.07
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1	G3
VALUES	.88	.67	.56	.48	.48	.47	.42	.39	.34	.36	.20

A.65

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	THRIE	D	E	G3	C	B	G4W	G1
VALUES	49.69	111.48	117.66	118.46	119.06	125.67	131.38	135.07	157.73	158.09	297.85
TOTAL COST	G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	453.16	536.14	576.32	603.55	704.15	712.53	726.21	729.96	776.57	836.93	1449.85
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1	G3
VALUES	.88	.69	.58	.48	.48	.48	.44	.40	.40	.39	.21

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	THRIE	D	E	G3	C	B	G4W	G1
VALUES	48.02	107.24	111.01	111.94	116.13	121.40	124.21	126.59	150.17	150.52	288.98
TOTAL COST	G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	451.50	529.49	567.46	595.07	694.88	709.60	718.64	725.72	768.99	830.41	1442.68
BENEFIT/COST	G2	A	C	E	D	G4S	B	G1	G4W	THRIE	G3
VALUES	.89	.70	.60	.49	.49	.49	.45	.42	.41	.41	.21

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	THRIE	D	E	G3	C	B	G4W	G1
VALUES	46.45	102.44	104.61	105.46	113.05	116.92	117.23	118.09	142.52	142.86	278.94
TOTAL COST	G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	449.93	523.08	557.41	586.56	695.40	706.52	710.99	721.42	761.34	823.94	1435.71
BENEFIT/COST	G2	A	C	E	D	G4S	B	G1	G4W	THRIE	G3
VALUES	.89	.72	.61	.50	.49	.49	.46	.46	.43	.42	.22

2R-7-6

2R-7-8

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 7-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 15 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 356.18
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	G1	C	B	G4W
VALUES	65.36	135.64	136.31	150.50	152.79	161.63	171.85	174.17	178.71	196.42	196.81
TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	452.65	468.84	580.11	647.18	729.78	731.26	754.12	764.90	815.28	868.97	1490.33
BENEFIT/COST	G2	G1	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.72	.65	.46	.38	.37	.36	.35	.29	.28	.26	.14

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G1	G3	C	B	G4W
VALUES	62.78	132.70	133.99	147.47	148.99	156.29	166.47	167.35	174.15	192.40	192.78
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	444.94	466.26	574.76	642.63	727.46	727.47	751.18	760.87	811.25	865.94	1485.82
BENEFIT/COST	G2	G1	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.73	.68	.48	.39	.37	.36	.36	.29	.29	.26	.14

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G1	G3	C	B	G4W
VALUES	60.21	129.61	131.62	144.05	145.15	150.57	158.17	162.44	169.19	188.00	188.38
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	436.65	463.69	569.04	637.67	723.63	725.10	748.08	756.47	806.85	862.53	1480.91
BENEFIT/COST	G2	G1	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.73	.71	.49	.40	.38	.37	.36	.30	.30	.27	.15

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G1	G3	C	B	G4W
VALUES	57.70	124.33	129.20	140.15	141.27	144.47	149.15	157.08	163.72	183.14	183.51
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	427.63	461.18	562.95	632.19	719.75	722.67	744.80	751.61	801.99	858.63	1475.55
BENEFIT/COST	G2	G1	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.74	.74	.51	.41	.38	.37	.37	.30	.30	.28	.15

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G1	G3	C	B	G4W
VALUES	55.31	122.85	126.71	135.67	137.38	138.04	139.28	151.23	157.61	177.72	178.09
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	417.75	458.78	556.51	626.09	715.85	720.18	741.33	744.20	796.57	854.15	1469.70
BENEFIT/COST	G2	G1	A	C	D	E	G4S	B	THRIE	G4W	G3
VALUES	.78	.75	.52	.42	.39	.38	.38	.31	.31	.29	.16

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 7-FT SHOULDER

2R-7-8

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 15 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 356.18

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	G1	THRIE	A	E	G3	C	B	G4W
VALUES	53.10	114.14	124.17	128.47	130.54	131.34	133.46	144.90	150.79	171.68	172.05
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	406.44	456.57	549.81	619.27	711.94	717.65	737.66	740.15	790.52	849.02	1463.37
BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G4W	G3
VALUES	.82	.75	.54	.44	.39	.38	.38	.32	.31	.30	.16

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	G1	D	A	THRIE	E	G3	C	B	G4W
VALUES	51.14	115.34	116.78	121.58	124.49	124.76	129.54	138.15	143.24	164.98	165.35
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	345.25	454.62	542.97	611.71	708.01	715.06	733.46	733.82	783.82	843.23	1456.62
BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G4W	G3
VALUES	.86	.76	.55	.45	.40	.39	.39	.34	.32	.31	.17

A.67

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	A	THRIE	D	E	G3	C	B	G4W
VALUES	49.43	104.52	111.34	117.66	118.46	118.91	125.54	131.13	135.07	157.73	158.09
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	383.00	452.91	536.14	603.55	704.02	712.39	726.21	724.82	776.57	836.93	1449.61
BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G4W	G3
VALUES	.90	.76	.57	.47	.40	.40	.40	.35	.33	.32	.17

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	A	THRIE	D	E	G3	C	B	G4W
VALUES	47.90	92.34	102.22	111.01	111.94	116.10	121.38	124.09	126.59	150.17	150.52
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	370.82	451.37	529.49	595.07	694.85	709.58	718.64	725.69	768.99	830.41	1442.56
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.95	.76	.59	.49	.41	.40	.40	.36	.34	.33	.18

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	A	THRIE	D	E	G3	C	B	G4W
VALUES	46.40	80.86	102.94	104.61	105.46	113.05	116.92	117.18	118.09	142.52	142.86
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	359.33	449.87	523.08	586.56	695.40	706.52	710.99	721.41	761.34	823.94	1435.66
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.94	.77	.60	.51	.41	.41	.41	.38	.35	.34	.18

2R-7-10

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 7-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 17 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 314.01

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	58.50	109.07	135.58	136.24	150.50	152.79	161.63	171.85	178.71	196.42	196.81
TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	387.55	461.98	580.11	647.18	729.72	731.26	754.05	764.90	815.28	869.97	1490.33
BENEFIT/COST	G1	G2	A	D	C	G4S	E	THRIE	B	G4W	G3
VALUES	.74	.63	.36	.30	.29	.29	.28	.23	.21	.19	.11
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	57.21	103.20	132.68	133.97	147.47	148.99	156.29	167.35	174.15	192.40	192.78
TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	381.67	460.69	574.76	642.63	727.44	727.46	751.15	760.87	811.25	865.94	1485.82
BENEFIT/COST	G1	G2	A	D	C	G4S	E	THRIE	B	G4W	G3
VALUES	.76	.64	.38	.30	.30	.29	.29	.23	.21	.20	.11
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	55.92	97.45	129.60	131.61	144.05	145.15	150.57	162.44	169.19	188.00	188.38
TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	375.92	458.39	569.04	637.67	723.63	725.09	748.07	756.47	806.85	862.53	1480.91
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.78	.64	.39	.31	.31	.30	.29	.24	.22	.20	.11
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	54.62	91.88	126.33	129.19	140.15	141.27	144.47	157.08	163.72	183.14	183.51
TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	370.36	458.10	562.95	632.19	719.75	722.67	744.80	751.61	801.99	858.63	1475.55
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.80	.64	.41	.32	.31	.30	.30	.24	.23	.21	.12
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	53.31	86.57	122.85	126.71	135.67	137.38	138.04	151.23	157.61	177.72	178.09
TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	365.04	456.79	556.51	626.09	715.85	720.18	741.33	746.20	796.57	854.15	1469.70
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.82	.65	.42	.33	.32	.31	.31	.25	.24	.22	.12

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 7-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 17 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 314.01
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

OF CURVE	1	2	3	4	5	6	7	8	9	10	11	
0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G1	G2	G4S	D	THRIE	A	E	G3	C	B	G4W
	VALUES	51.99	81.59	119.19	124.17	130.54	131.34	133.46	144.90	150.79	171.68	172.05
	TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	360.07	455.47	549.81	619.27	711.94	717.65	732.66	740.15	790.52	849.02	1463.37
	BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
	VALUES	.83	.65	.44	.35	.32	.32	.31	.26	.25	.23	.13
-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	A	THRIE	E	G3	C	B	G4W
	VALUES	50.65	77.02	115.34	121.58	124.49	124.76	129.54	138.15	143.24	164.98	165.35
	TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	355.49	454.12	542.97	611.71	708.01	715.06	733.46	733.82	783.82	843.23	1456.62
	BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
	VALUES	.85	.65	.45	.36	.32	.32	.32	.26	.26	.24	.13
-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	A	THRIE	D	E	G3	C	B	G4W
	VALUES	49.28	72.81	111.34	117.66	118.46	118.91	125.54	131.13	135.07	157.73	158.09
	TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	351.29	452.76	536.14	603.55	704.02	712.39	726.21	729.82	776.57	836.93	1449.61
	BENEFIT/COST	G1	G2	A	C	D	G4S	E	B	THRIE	G4W	G3
	VALUES	.87	.66	.47	.38	.33	.33	.33	.27	.27	.25	.14
-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	A	THRIE	D	E	G3	C	B	G4W
	VALUES	47.87	68.85	107.22	111.01	111.94	116.10	121.38	124.09	126.59	150.17	150.52
	TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	347.33	451.35	529.49	595.07	699.85	709.58	718.64	725.69	768.99	830.41	1442.56
	BENEFIT/COST	G1	G2	A	C	D	G4S	E	B	THRIE	G4W	G3
	VALUES	.88	.66	.49	.40	.33	.33	.33	.29	.28	.26	.14
-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	A	THRIE	D	E	G3	C	B	G4W
	VALUES	46.40	64.98	102.94	104.61	105.46	113.05	116.92	117.18	118.09	142.52	142.86
	TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	343.45	449.87	523.08	586.56	695.40	706.52	710.99	721.41	761.34	823.94	1435.66
	BENEFIT/COST	G1	G2	A	C	D	G4S	E	B	THRIE	G4W	G3
	VALUES	.89	.66	.50	.42	.34	.34	.34	.30	.29	.28	.15

A.69

A.69

2R-7-10

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 7-FT SHOULDER

2R-7-12

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 19 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 278.35

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	58.50	67.45	135.58	136.24	150.50	152.79	161.63	165.22	178.71	196.42	196.81
TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	345.92	461.98	580.11	647.18	729.72	731.26	754.05	764.90	815.28	868.97	1483.70
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.76	.54	.28	.24	.23	.22	.21	.18	.14	.13	.09

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	57.21	64.66	132.68	133.97	147.47	148.99	156.29	161.96	174.15	192.40	192.78
TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	343.14	460.69	574.76	642.63	727.44	727.46	751.15	760.87	811.25	865.94	1480.44
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.77	.55	.29	.24	.24	.22	.22	.18	.15	.14	.09

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	55.92	62.01	129.60	131.61	144.05	145.15	150.57	158.28	169.19	188.00	188.38
TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	340.49	459.39	569.04	637.67	723.63	725.09	748.07	756.47	806.85	862.53	1476.76
BENEFIT/COST	G1	G2	A	D	G4S	C	E	THRIE	B	G4W	G3
VALUES	.78	.55	.31	.25	.24	.23	.23	.19	.16	.15	.09

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	54.62	59.54	126.33	129.19	140.15	141.27	144.47	154.10	163.72	183.14	183.51
TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	338.02	458.10	562.95	632.19	719.75	722.67	744.80	751.61	801.99	858.63	1472.57
BENEFIT/COST	G1	G2	A	D	G4S	C	E	THRIE	B	G4W	G3
VALUES	.79	.55	.32	.25	.25	.24	.24	.19	.17	.15	.09

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	53.31	57.34	122.85	126.71	135.67	137.38	138.04	149.30	157.61	177.72	178.09
TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	335.81	456.79	556.51	626.09	715.85	720.18	741.33	746.20	796.57	854.15	1467.78
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.79	.56	.34	.26	.26	.25	.24	.20	.18	.16	.10

A.70

2-LANE RURAL ROAD WITH 7-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT	GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT
PAVEMENT-TO-OBSTACLE DISTANCE = 19 FT	SOCIETAL COST WITH NO GUARDRAIL = \$ 278.35
GAADT = 1000	GUARDRAIL LENGTH = 100 FT
	OBSTACLE LENGTH = 100 FT

2R-7-12

DEGREE OF CURVE	1	2	3	4	5	6	7	8
PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA								

[illegible]

A.71

	G1	G2	A	C	B	E	D	G+W	G+S	T+R+E	G3
RATE COST											
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
NETAL COST	G2	G1	G+S	D	A	T+R+E	E	G3	C	B	G+W
VALUES	50.65	54.05	115.34	121.58	124.49	124.76	129.54	137.67	143.24	164.48	165.35
TOTAL COST	G1	G2	A	C	E	D	B	G+S	G+W	T+R+E	G3
VALUES	332.53	454.12	542.47	611.71	708.01	715.06	733.46	733.82	783.82	843.23	1456.15
NETIT/COST	G1	G2	A	C	D	G+S	E	T+R+E	B	G+W	G3
VALUES	.81	.56	.37	.29	.26	.26	.26	.21	.20	.18	.11

	G1	G2	A	C	B	E	D	G+W	G+S	THRIE	G3
ATE COST											
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
NETAL COST	G2	G1	G+S	G+S	THRIE	D	E	G3	C	B	G+W
VALUES	49.28	53.04	111.34	117.66	118.46	118.91	125.54	130.98	135.07	157.73	158.09
NETAL COST	G1	G2		E	D	B	G+S	G+S	G+W	THRIE	G3
VALUES	331.51	452.76	536.14	603.55	704.02	712.39	726.21	729.82	776.57	836.93	1449.46
NETFIT/COST	G1	G2	A	C	G+S	D	E	THRIE	B	G+W	G3
VALUES	.81	.57	.38	.31	.27	.27	.26	.22	.21	.19	.11

	G1	G2	A	C	B	E	D	G4W	G4S	THALE	G3
ATE COST											
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
CITAL COST	G2	G1	G4S		THRIE	D	E	G3	C	B	G4W
VALUES	47.87	52.33	107.22	111.01	111.94	116.10	121.38	124.06	126.59	150.17	150.52
TAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THALE	G3
VALUES	330.80	451.35	529.49	595.07	699.85	709.58	718.64	725.69	768.99	830.41	1442.54
NEIT/COST	G1	G2	A	C	G4S	D	E	THALE	B	G4W	G3
VALUES	.81	.57	.40	.32	.28	.27	.27	.23	.23	.21	.12

	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
ATE COST											
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
CIETAL COST	G2	G1	G4S	A	THRIE	D	E	G3	C	B	G4W
VALUES	46.40	51.75	102.94	104.61	105.46	113.05	116.92	117.18	118.09	142.52	142.86
TAL COST	G1	G2	A	C	E	D	B	G4W	G4S	THRIE	G3
VALUES	330.23	449.87	523.08	586.56	695.40	706.52	710.99	721.41	761.34	823.94	1435.66
NEFIT/COST	G1	G2	A	C	G4S	E	D	THRIE	B	G4W	G3
VALUES	.81	.57	.42	.34	.28	.28	.28	.24	.24	.22	.12

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 8 FT

2R-8-0

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 8 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 204.26
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

10	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	A	G2	C	G3	C	B	B	G4W	G1
VALUES	137.74	137.93	144.96	150.45	155.65	166.31	170.26	181.37	192.18	197.55	356.35	
TOTAL COST	A	G2	G1	C	D	E	G4S	B	G4W	THRIE	G3	
VALUES	568.42	564.79	634.82	649.85	731.40	734.13	756.21	765.66	816.02	863.43	1488.74	
BENEFIT/COST	A	D	G4S	G2	E	THRIE	C	G3	B	G4W	G1	
VALUES	.13	.11	.11	.09	.08	.08	.05	.03	.01	.01	-.55	

8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	A	G2	C	G3	C	B	B	G4W	G1
VALUES	133.82	134.50	142.39	146.58	150.63	154.06	165.43	175.91	192.19	192.55	352.16	
TOTAL COST	G2	A	G1	C	D	E	G4S	B	G4W	THRIE	G3	
VALUES	562.53	565.05	630.64	644.39	727.98	729.10	752.30	760.66	811.02	860.87	1483.90	
BENEFIT/COST	A	D	G4S	G2	E	THRIE	C	G3	B	G4W	G1	
VALUES	.14	.12	.11	.09	.09	.09	.06	.03	.02	.02	-.53	

A.72

6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	A	G2	C	G3	C	B	B	G4W	G1
VALUES	129.81	131.07	139.52	142.41	145.62	151.25	160.33	170.11	186.91	187.27	347.59	
TOTAL COST	G2	A	G1	C	D	E	G4S	B	G4W	THRIE	G3	
VALUES	554.72	560.88	626.07	638.59	724.10	724.54	748.29	755.38	805.74	857.99	1478.81	
BENEFIT/COST	A	D	G4S	G2	E	THRIE	C	G3	B	G4W	G1	
VALUES	.15	.13	.12	.10	.10	.09	.07	.03	.03	.03	-.51	

4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	A	G2	C	G3	C	B	B	G4W	G1
VALUES	125.70	127.65	136.22	137.87	140.66	142.75	154.91	163.91	181.29	181.64	342.54	
TOTAL COST	G2	A	G1	C	D	E	G4S	B	G4W	THRIE	G3	
VALUES	546.22	556.34	621.02	632.39	719.13	721.13	744.18	749.76	800.12	854.70	1473.39	
BENEFIT/COST	A	D	G4S	G2	E	THRIE	C	B	G3	G4W	G1	
VALUES	.16	.15	.13	.11	.11	.09	.09	.04	.04	.04	-.50	

2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	A	G2	C	G3	C	B	B	G4W	G1
VALUES	121.52	124.29	132.39	132.90	133.39	135.80	149.11	152.24	175.28	175.63	336.90	
TOTAL COST	G2	A	G1	C	D	E	G4S	B	G4W	THRIE	G3	
VALUES	536.86	551.37	615.38	625.22	714.28	717.77	740.00	743.75	794.11	850.86	1467.59	
BENEFIT/COST	A	D	G4S	G2	E	C	THRIE	B	G4W	G3	G1	
VALUES	.18	.17	.13	.13	.12	.10	.10	.05	.05	.04	-.48	

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 8 FT

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 8 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 204.26

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE

1	2	3	4	5	6	7	8	9	10	11
0	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48
	SOCIETAL COST	G4S	D	G2	A	THRIE	E	G3	B	G4W
	VALUES	117.31	121.08	123.01	127.46	127.90	131.14	142.90	150.05	168.83
	TOTAL COST	G2	A	G1	C	E	D	G4S	B	THRIE
	VALUES	526.48	545.94	604.00	618.52	704.61	714.55	735.79	737.31	846.37
	BENEFIT/COST	G2	A	G4S	D	E	C	THRIE	B	G3
	VALUES	.20	.18	.14	.14	.13	.12	.11	.06	.05

-2	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48
	SOCIETAL COST	G2	G4S	D	A	THRIE	E	G3	C	G4W
	VALUES	111.51	113.15	118.07	121.54	122.66	126.74	136.27	142.31	161.94
	TOTAL COST	G2	A	G1	C	E	D	B	G4S	THRIE
	VALUES	514.99	540.02	601.23	610.78	705.21	711.55	730.41	731.63	841.14
	BENEFIT/COST	G2	A	G4S	D	E	C	THRIE	B	G3
	VALUES	.23	.20	.15	.15	.13	.13	.11	.07	.05

-4	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48
	SOCIETAL COST	G2	G4S	A	D	THRIE	E	G3	C	G4W
	VALUES	99.01	104.08	115.21	115.30	116.71	122.61	129.24	134.07	154.63
	TOTAL COST	G2	A	G1	C	E	D	B	G4S	THRIE
	VALUES	502.49	533.64	593.45	602.55	701.04	708.78	723.10	727.55	835.14
	BENEFIT/COST	G2	A	G4S	D	C	E	THRIE	B	G3
	VALUES	.26	.21	.15	.15	.15	.14	.12	.09	.06

-6	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48
	SOCIETAL COST	G2	G4S	A	THRIE	D	E	G3	C	G4W
	VALUES	85.99	105.06	108.65	110.28	112.67	118.63	122.11	125.52	147.04
	TOTAL COST	G2	A	G1	C	E	D	B	G4S	THRIE
	VALUES	489.47	527.12	584.04	593.99	697.11	706.15	715.52	723.54	828.75
	BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G3
	VALUES	.29	.23	.17	.16	.15	.15	.13	.10	.06

-8	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48
	SOCIETAL COST	G2	G4S	A	THRIE	D	E	G3	C	G4W
	VALUES	73.34	101.03	102.15	103.76	109.98	114.56	115.06	116.95	139.41
	TOTAL COST	G2	A	G1	C	E	D	B	G4S	THRIE
	VALUES	476.81	520.63	573.63	585.43	693.04	703.46	707.84	719.51	822.24
	BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G3
	VALUES	.32	.24	.14	.17	.16	.16	.14	.11	.07

A.73

2R-8-0

2R-8-2

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 8-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 10 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 498.06

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	D	C	A	G4S	E	B	G4W	G2	G1
VALUES	189.40	250.46	257.48	264.06	310.78	340.79	341.47	374.89	375.26	391.83	516.62
TOTAL COST	A	C	G1	G2	D	THRIE	E	B	G4S	G4W	G3
VALUES	729.25	732.54	795.10	795.31	850.96	908.38	919.94	943.37	959.27	993.73	1569.43
BENEFIT/COST	C	A	THRIE	D	E	G2	G4S	B	G4W	G3	G1
VALUES	.50	.45	.43	.41	.27	.26	.25	.22	.20	.19	-.07
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	D	C	A	G4S	E	B	G4W	G2	G1
VALUES	183.10	243.44	249.40	255.39	306.09	334.36	335.44	368.79	369.15	384.91	516.58
TOTAL COST	C	A	G2	G1	D	THRIE	E	B	G4S	G4W	G3
VALUES	723.87	724.56	788.39	795.06	843.38	901.58	913.92	937.27	952.84	987.63	1561.91
BENEFIT/COST	C	A	THRIE	D	E	G2	G4S	B	G4W	G3	G1
VALUES	.52	.46	.44	.42	.28	.28	.26	.23	.21	.19	-.07
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	D	C	A	G4S	E	B	G4W	G2	G1
VALUES	176.04	235.10	241.68	245.69	300.50	327.10	328.69	361.70	362.06	376.91	516.54
TOTAL COST	C	A	G2	G1	D	THRIE	E	B	G4S	G4W	G3
VALUES	714.36	718.97	780.38	795.01	835.15	894.51	907.17	930.17	945.57	980.53	1553.58
BENEFIT/COST	C	A	THRIE	D	G2	E	G4S	B	G4W	G3	G1
VALUES	.54	.47	.45	.43	.30	.29	.28	.24	.22	.20	-.07
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	D	C	A	G4S	E	B	G4W	G2	G1
VALUES	148.65	225.73	232.64	235.34	293.78	318.79	321.04	353.36	353.71	367.55	516.50
TOTAL COST	C	A	G2	G1	D	THRIE	E	B	G4S	G4W	G3
VALUES	703.81	712.26	771.03	794.97	826.11	887.13	899.51	921.83	937.26	972.19	1544.21
BENEFIT/COST	C	A	THRIE	D	G2	E	G4S	B	G4W	G3	G1
VALUES	.56	.49	.46	.45	.32	.31	.29	.25	.23	.21	-.07
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	D	C	A	G4S	E	B	G4W	G2	G1
VALUES	160.88	215.07	222.59	223.47	285.68	309.20	312.27	343.46	343.82	356.53	516.46
TOTAL COST	C	A	G2	G1	D	THRIE	E	B	G4S	G4W	G3
VALUES	691.95	704.15	760.01	794.93	816.06	879.36	890.75	911.94	927.67	962.99	1533.55
BENEFIT/COST	C	A	THRIE	D	G2	E	G4S	B	G4W	G3	G1
VALUES	.59	.51	.47	.46	.35	.32	.31	.27	.25	.21	-.07

A.74

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 8-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 10 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 498.06
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA											
0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRUE
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	1318.48
	SOCIETAL COST	THRUE	G3	C	D	A	G4S	E	B	G4W	G1
	VALUES	152.66	202.85	210.01	211.32	275.90	298.08	302.19	331.69	332.04	516.42
	TOTAL COST	C	A	G2	G1	D	THRUE	E	B	G4S	G3
	VALUES	678.44	644.37	747.00	794.89	804.80	871.13	880.66	900.17	916.55	1521.32
	BENEFIT/COST	C	A	D	THRUE	G2	E	G4S	B	G4W	G1
	VALUES	.61	.53	.48	.48	.38	.34	.32	.29	.27	-.07

-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRUE
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	1318.48
	SOCIETAL COST	THRUE	G3	C	D	A	G4S	E	B	G4W	G1
	VALUES	143.94	188.86	194.76	198.69	254.22	285.23	290.59	317.78	318.13	516.39
	TOTAL COST	C	A	G2	G1	D	THRUE	E	B	G4S	G3
	VALUES	663.23	682.69	731.75	792.16	794.86	862.42	864.07	886.26	903.70	1507.34
	BENEFIT/COST	C	A	D	THRUE	G2	E	G4S	B	G4W	G1
	VALUES	.65	.56	.50	.49	.42	.36	.34	.32	.29	-.07

-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRUE
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	1318.48
	SOCIETAL COST	THRUE	G3	C	D	A	G4S	E	B	G4W	G1
	VALUES	134.77	173.22	177.79	184.77	250.61	270.62	277.44	301.72	302.06	516.36
	TOTAL COST	C	A	G2	D	G1	THRUE	E	B	G4S	G3
	VALUES	646.27	669.08	714.25	728.24	794.84	853.25	855.92	870.19	889.10	1491.69
	BENEFIT/COST	C	A	D	THRUE	G2	E	G4S	B	G4W	G1
	VALUES	.68	.59	.53	.51	.46	.38	.37	.35	.32	-.07

-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRUE
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	1318.48
	SOCIETAL COST	THRUE	G3	C	D	A	G4S	E	B	G4W	G1
	VALUES	125.31	156.57	159.76	170.05	235.45	254.57	262.94	283.95	284.29	516.34
	TOTAL COST	C	A	G2	D	G1	THRUE	E	B	G4S	G3
	VALUES	628.24	653.92	694.98	763.53	794.81	841.41	843.79	852.43	873.04	1475.05
	BENEFIT/COST	C	A	D	THRUE	G2	E	G4S	B	G4W	G1
	VALUES	.72	.63	.55	.52	.51	.41	.39	.38	.35	-.07

-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRUE
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	1318.48
	SOCIETAL COST	THRUE	G3	C	D	A	G4S	E	B	G4W	G1
	VALUES	115.89	140.12	141.84	155.45	219.46	237.69	247.52	265.39	265.72	516.31
	TOTAL COST	C	A	G2	D	G1	THRUE	E	B	G4S	G3
	VALUES	610.32	637.93	674.85	748.92	794.79	826.00	833.87	834.37	856.16	1458.54
	BENEFIT/COST	C	A	D	G2	THRUE	E	G4S	B	G4W	G1
	VALUES	.76	.67	.58	.56	.53	.43	.42	.41	.38	-.07

2R-8-2

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 8-FT SHOULDER

2R-8-4

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 434.21

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

11

10	STATE COST	G1	2	3	4	5	6	7	8	9	10	11
VALUES	278.48	G2	403.48	A	418.48	C	468.48	568.48	578.48	593.48	G4S	THRIE G3
SOCIETAL COST	G4S	D	403.48	A	418.48	THRIE	G2	568.48	G3	C	B	1318.48
VALUES	139.46	G2	139.80	150.45	152.24	G1	166.31	170.25	181.37	191.10	201.17	201.53
TOTAL COST	A	G2	A	C	G1	D	G4S	E	F	B	G4W	453.66
VALUES	568.92	A	569.79	649.85	732.13	733.28	757.94	769.57	769.57	820.01	820.01	1488.74
BENEFIT/COST	A	G2	G2	C	D	G4S	E	B	THRIE	G4W	G3	G1
VALUES	.68	.66	.54	.54	.50	.48	.42	.41	.39	.38	.20	-.07

8	STATE COST	G1	2	3	4	5	6	7	8	9	10	11
VALUES	278.48	G2	403.48	A	418.48	C	468.48	568.48	578.48	593.48	G4S	THRIE G3
SOCIETAL COST	G4S	D	403.48	A	418.48	THRIE	G2	568.48	G3	C	B	1318.48
VALUES	135.20	G2	136.00	146.58	148.39	D	159.06	165.43	175.91	183.32	195.42	195.78
TOTAL COST	A	G2	A	C	D	G1	G4S	E	F	B	G4W	452.00
VALUES	562.53	A	565.05	644.39	729.48	730.47	753.68	761.80	763.89	814.25	866.87	1483.90
BENEFIT/COST	A	G2	G2	C	D	G4S	E	B	THRIE	G4W	G3	G1
VALUES	.69	.68	.55	.55	.50	.48	.43	.42	.40	.39	.20	-.06

6	STATE COST	G1	2	3	4	5	6	7	8	9	10	11
VALUES	278.48	G2	403.48	A	418.48	C	468.48	568.48	578.48	593.48	G4S	THRIE G3
SOCIETAL COST	G4S	D	403.48	A	418.48	THRIE	G2	568.48	G3	C	B	1318.48
VALUES	130.90	G2	132.25	142.41	144.23	D	151.25	160.33	170.11	175.62	189.44	189.80
TOTAL COST	A	G2	A	C	D	G1	G4S	E	F	B	G4W	450.20
VALUES	554.72	A	560.88	638.59	725.72	728.67	749.37	754.09	757.92	808.28	862.71	1478.81
BENEFIT/COST	A	G2	G2	C	D	G4S	E	B	THRIE	G4W	G3	G1
VALUES	.70	.70	.56	.56	.51	.49	.45	.43	.40	.40	.21	-.06

4	STATE COST	G1	2	3	4	5	6	7	8	9	10	11
VALUES	278.48	G2	403.48	A	418.48	C	468.48	568.48	578.48	593.48	G4S	THRIE G3
SOCIETAL COST	G4S	D	403.48	A	418.48	THRIE	G2	568.48	G3	C	B	1318.48
VALUES	126.55	G2	128.57	137.87	139.70	D	142.75	154.91	163.91	168.01	183.21	183.56
TOTAL COST	A	G2	A	C	D	G1	G4S	E	F	B	G4W	448.23
VALUES	546.22	A	556.34	632.39	722.05	726.71	745.03	746.49	751.68	802.04	858.17	1473.39
BENEFIT/COST	A	G2	G2	C	D	G4S	E	B	THRIE	G4W	G3	G1
VALUES	.72	.71	.58	.58	.51	.50	.46	.44	.41	.41	.21	-.05

2	STATE COST	G1	2	3	4	5	6	7	8	9	10	11
VALUES	278.48	G2	403.48	A	418.48	C	468.48	568.48	578.48	593.48	G4S	THRIE G3
SOCIETAL COST	G4S	D	403.48	A	418.48	THRIE	G2	568.48	G3	C	B	1318.48
VALUES	122.19	G2	125.01	132.90	133.39	D	134.71	149.11	157.24	160.57	176.66	177.01
TOTAL COST	A	G2	A	C	D	G1	G4S	E	F	B	G4W	446.08
VALUES	536.86	A	551.37	625.72	718.49	724.56	739.04	740.67	745.14	795.49	853.19	1467.59
BENEFIT/COST	A	G2	G2	C	D	G4S	E	B	THRIE	G4W	G3	G1
VALUES	.75	.72	.59	.59	.52	.50	.47	.45	.42	.42	.22	-.04

A.76

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 8-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 434.21

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1	2	3	4	5	6	7	8	9	10	11
0										
STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	G2	A	THRIE	G3	C	B	G4W	G1
VALUES	117.85	121.63	123.01	127.46	129.25	142.90	150.05	153.33	169.77	443.71
TOTAL COST	G2	A	C	D	G1	E	G4S	B	THRIE	G3
VALUES	526.48	545.94	618.52	715.11	722.19	731.80	736.32	738.25	847.73	1461.38
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THRIE	G1
VALUES	.77	.73	.61	.53	.51	.49	.47	.43	.42	-.03
-2										
STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	A	THRIE	G3	C	B	G4W	G1
VALUES	111.51	113.56	118.49	121.54	123.30	136.27	142.31	146.34	162.53	441.09
TOTAL COST	G2	A	C	D	G1	E	B	G4S	THRIE	G3
VALUES	514.99	540.02	610.78	711.97	719.56	724.81	731.01	732.04	841.78	1454.75
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THRIE	G1
VALUES	.80	.75	.62	.53	.52	.50	.48	.44	.43	-.02
-4										
STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	D	THRIE	G3	C	B	G4W	G1
VALUES	99.01	109.37	115.21	115.59	116.93	129.24	134.07	139.57	154.98	438.14
TOTAL COST	G2	A	C	D	G1	E	B	G4S	THRIE	G3
VALUES	502.49	533.69	602.55	709.07	716.62	718.62	723.45	727.84	835.41	1447.76
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THRIE	G1
VALUES	.83	.76	.64	.54	.53	.51	.49	.45	.44	-.01
-6										
STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	THRIE	D	G3	C	B	G4W	G1
VALUES	85.99	105.23	108.65	110.32	112.84	122.11	125.52	132.90	147.22	434.82
TOTAL COST	G2	A	C	D	E	G1	B	G4S	THRIE	G3
VALUES	489.47	527.12	593.99	706.32	711.37	713.30	715.70	723.71	766.03	1440.59
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THRIE	G1
VALUES	.86	.78	.66	.54	.53	.52	.50	.46	.45	-.00
-8										
STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	THRIE	D	G3	C	B	G4W	G1
VALUES	73.34	101.11	102.15	103.77	110.06	115.06	116.95	126.10	139.49	431.04
TOTAL COST	G2	A	C	D	E	G1	B	G4S	THRIE	G3
VALUES	476.81	520.63	585.43	703.54	704.58	707.97	709.52	719.59	758.29	1433.54
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THRIE	G1
VALUES	.89	.79	.68	.55	.54	.53	.52	.48	.46	.01

A.77

2R-8-4

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 8-FT SHOULDER

2R-8-6

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 380.06

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10. STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	C	B	G4W	G1
VALUES	68.28	137.74	137.93	144.96	155.65	156.96	170.29	174.37	190.43	190.79	315.70
TOTAL COST	G2	A	G1	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	471.76	575.44	594.17	642.85	731.40	734.13	756.21	758.90	809.26	863.43	1488.76
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G1	G3
VALUES	.77	.53	.44	.41	.39	.39	.33	.33	.31	.23	.16

8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	C	B	G4W	G1
	VALUES	64.77	133.82	134.50	142.39	150.63	151.92	165.44	170.17	186.64	187.01	313.27
	TOTAL COST	G2	A	G1	C	D	E	G4S	B	G4W	THRIE	G3
	VALUES	468.25	570.40	591.75	638.65	727.98	729.10	752.30	755.12	805.48	860.87	1483.92
	BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G1	G3
	VALUES	.78	.55	.45	.41	.40	.40	.34	.33	.31	.24	.16

A.78

6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	C	B	G4W	G1
	VALUES	61.38	129.81	131.07	139.52	145.62	146.59	160.34	165.61	182.56	182.92	310.46
	TOTAL COST	G2	A	G1	C	D	E	G4S	B	G4W	THRIE	G3
	VALUES	464.85	565.07	588.94	634.09	724.10	724.54	748.29	751.04	801.40	857.99	1478.81
	BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1	G3
	VALUES	.79	.56	.46	.42	.41	.40	.35	.33	.32	.25	.17

4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	C	B	G4W	G1
	VALUES	58.12	125.70	127.65	136.22	140.66	140.95	154.91	160.61	178.10	178.45	307.16
	TOTAL COST	G2	A	G1	C	D	E	G4S	B	G4W	THRIE	G3
	VALUES	461.60	559.42	585.64	629.08	719.13	721.13	744.18	746.57	796.43	854.70	1473.39
	BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1	G3
	VALUES	.80	.57	.47	.43	.41	.41	.36	.34	.33	.26	.17

2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	A	E	G3	C	B	G4W	G1
	VALUES	55.08	121.52	124.29	132.39	134.96	135.80	149.11	155.03	173.14	173.49	303.27
	TOTAL COST	G2	A	G1	C	D	E	G4S	B	G4W	THRIE	G3
	VALUES	458.55	553.44	581.74	623.50	714.28	717.77	740.00	741.62	791.47	850.86	1467.59
	BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1	G3
	VALUES	.81	.59	.48	.43	.42	.42	.36	.34	.33	.28	.18

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 8-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 380.06

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	A	E	G3	B	G4W	G1
	VALUES	52.31	117.31	121.08	127.90	128.66	131.14	142.90	148.76	167.59	298.63
	TOTAL COST	G2	A	G1	C	E	D	G4S	B	THRIE	G3
	VALUES	455.79	547.14	577.11	617.23	705.61	714.55	735.79	736.06	846.37	1461.38
	BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G1	G3
	VALUES	.81	.60	.49	.44	.43	.42	.37	.35	.29	.18
-2	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	A	E	G3	B	G4W	G1
	VALUES	49.91	113.15	118.07	122.11	122.66	126.74	136.27	141.70	161.35	293.12
	TOTAL COST	G2	A	G1	C	E	D	B	G4S	THRIE	G3
	VALUES	453.38	540.59	571.59	610.17	705.21	711.55	729.82	731.63	841.14	1454.75
	BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G1	G3
	VALUES	.82	.62	.51	.44	.44	.43	.38	.36	.31	.18
-4	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	A	E	G3	B	G4W	G1
	VALUES	47.89	109.08	115.30	115.40	116.71	122.61	129.29	133.87	154.43	286.59
	TOTAL COST	G2	A	G1	C	E	D	B	G4S	THRIE	G3
	VALUES	451.37	533.88	565.07	602.34	701.09	708.78	722.91	727.55	835.19	1447.76
	BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G1	G3
	VALUES	.82	.63	.53	.45	.45	.44	.40	.37	.34	.19
-6	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	A	THRIE	D	E	G3	B	G4W	G1
	VALUES	46.14	105.06	108.69	110.28	112.67	118.63	122.11	125.48	147.00	279.00
	TOTAL COST	G2	A	G1	C	E	D	B	G4S	THRIE	G3
	VALUES	449.67	527.16	557.48	593.95	697.11	706.15	715.48	723.54	828.75	1440.59
	BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1	G3
	VALUES	.83	.65	.54	.45	.45	.44	.41	.38	.36	.20
-8	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	A	THRIE	D	E	G3	B	G4W	G1
	VALUES	44.66	101.03	102.15	103.76	109.98	114.56	115.06	116.95	139.41	270.32
	TOTAL COST	G2	A	G1	C	E	D	B	G4S	THRIE	G3
	VALUES	448.13	520.63	548.80	585.43	693.04	703.46	707.88	719.51	822.24	1433.54
	BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1	G3
	VALUES	.83	.66	.56	.46	.46	.45	.42	.39	.38	.20

A.79

2R-8-6

2R-8-8

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 8-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 334.21
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10	1	2	3	4	5	6	7	8	9	10	11
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	D	G4S	THRIE	E	A	G3	G1	C	B	G4W
VALUES	63.95	130.93	130.98	144.96	149.29	156.87	166.13	173.75	174.46	190.34	190.70
TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	452.23	467.43	575.35	642.94	724.40	727.77	749.45	758.81	809.17	863.43	1484.61
BENEFIT/COST	G2	G1	A	D	C	G4S	E	THRIE	B	G4W	G3
VALUES	.67	.58	.42	.34	.34	.33	.32	.26	.25	.23	.13

8	1	2	3	4	5	6	7	8	9	10	11
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	G1	C	B	G4W
VALUES	61.28	128.28	128.76	142.39	145.44	151.88	162.08	166.28	170.21	186.60	186.96
TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	444.76	464.76	570.35	638.69	720.24	723.92	746.76	755.08	805.44	860.87	1480.56
BENEFIT/COST	G2	G1	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.68	.60	.44	.35	.35	.33	.33	.27	.26	.24	.13

6	1	2	3	4	5	6	7	8	9	10	11
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	G1	C	B	G4W
VALUES	58.65	125.47	126.57	139.52	141.57	146.58	157.71	158.29	165.63	182.55	182.91
TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	436.77	462.12	565.05	634.11	720.04	720.05	743.94	751.02	801.38	857.94	1476.18
BENEFIT/COST	G2	G1	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.68	.63	.45	.36	.35	.34	.33	.27	.27	.24	.13

4	1	2	3	4	5	6	7	8	9	10	11
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	G1	C	B	G4W
VALUES	56.07	122.51	124.34	136.22	137.69	140.94	149.65	152.93	160.61	178.09	178.45
TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	428.13	459.54	559.42	629.09	716.16	717.82	740.94	746.57	796.92	854.70	1471.40
BENEFIT/COST	G2	G1	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.69	.66	.46	.37	.35	.34	.34	.28	.27	.25	.14

2	1	2	3	4	5	6	7	8	9	10	11
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	G1	C	B	G4W
VALUES	53.60	119.38	122.08	132.39	133.82	134.96	140.21	147.68	155.03	173.14	173.49
TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	418.69	457.07	553.43	623.51	712.29	715.56	737.86	741.62	791.97	850.86	1466.16
BENEFIT/COST	G2	G1	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.70	.70	.48	.38	.36	.35	.35	.28	.28	.26	.14

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 8-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 334.21

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	A	G1	E	G3	C	B	G4W
VALUES	51.30	116.07	119.79	127.90	128.66	129.81	129.98	141.93	148.76	167.59	167.94
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	408.29	454.28	547.14	617.23	708.46	713.26	734.55	736.06	786.41	846.37	1460.41
BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G4W	G3
VALUES	.73	.70	.49	.40	.36	.35	.35	.29	.29	.27	.15

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	A	THRIE	E	G3	C	B	G4W
VALUES	49.27	112.57	117.47	118.37	122.11	122.66	126.19	135.66	141.70	161.35	161.69
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	396.84	452.75	540.59	610.17	704.67	710.94	729.82	731.04	780.17	841.14	1454.13
BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G4W	G3
VALUES	.78	.71	.51	.41	.37	.36	.36	.30	.29	.28	.15

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	A	THRIE	E	G3	C	B	G4W
VALUES	47.52	105.98	108.88	115.10	115.40	116.71	122.43	128.93	133.87	154.43	154.77
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	384.46	451.00	533.88	602.34	700.91	708.57	722.91	727.35	773.25	835.19	1447.40
BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G4W	G3
VALUES	.82	.71	.52	.43	.37	.37	.36	.32	.30	.29	.16

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	A	THRIE	D	E	G3	C	B	G4W
VALUES	46.00	93.16	105.02	108.69	110.28	112.63	118.60	121.93	125.48	147.00	147.34
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	371.63	449.48	527.16	593.95	697.08	706.11	715.48	723.50	765.81	828.75	1440.41
BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G4W	G3
VALUES	.87	.71	.54	.45	.37	.37	.37	.33	.31	.30	.16

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	A	THRIE	D	E	G3	C	B	G4W
VALUES	44.57	80.74	101.03	102.15	103.76	104.98	114.56	114.98	116.95	139.41	139.74
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	359.22	448.05	520.63	585.43	693.04	703.45	707.88	719.50	758.21	822.24	1433.45
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.91	.72	.55	.46	.38	.38	.38	.34	.32	.31	.17

A.81

2R-8-8

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 8-FT SHOULDER

2R-8-10

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 18 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 295.43

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	D	G4S	THRIE	E	A	G3	C	B	G4W
VALUES	56.59	110.77	130.84	130.84	144.96	149.29	156.87	166.13	174.46	190.34	190.70
TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	389.24	460.07	575.35	642.94	724.31	727.77	749.36	758.81	809.17	863.43	1484.61
BENEFIT/COST	G1	G2	A	D	G4S	C	E	THRIE	B	G4W	G3
VALUES	.66	.59	.33	.28	.27	.26	.25	.21	.18	.17	.10

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G2	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	55.25	104.42	128.24	128.24	142.39	145.44	151.88	162.08	170.21	186.60	186.96
TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	382.89	458.72	570.35	634.69	722.19	723.92	746.71	755.08	805.44	860.87	1480.56
BENEFIT/COST	G1	G2	A	D	G4S	C	E	THRIE	B	G4W	G3
VALUES	.69	.60	.34	.28	.27	.27	.26	.21	.19	.18	.10

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	53.92	98.20	125.45	126.55	139.52	141.57	146.58	157.71	165.63	182.55	182.91
TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	376.67	457.39	565.05	634.11	720.03	720.05	743.93	751.02	801.38	857.49	1476.18
BENEFIT/COST	G1	G2	A	D	C	G4S	E	THRIE	B	G4W	G3
VALUES	.71	.60	.36	.28	.28	.27	.27	.22	.20	.18	.10

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	52.59	92.16	122.51	124.34	136.22	137.69	140.94	152.93	160.61	178.09	178.45
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	370.64	456.07	559.42	629.09	716.16	717.81	740.98	746.57	796.92	854.70	1471.40
BENEFIT/COST	G1	G2	A	D	C	G4S	E	THRIE	B	G4W	G3
VALUES	.73	.60	.37	.29	.29	.28	.27	.22	.21	.19	.11

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	51.27	86.39	119.38	122.08	132.39	133.82	134.96	147.68	155.03	173.14	173.49
TOTAL COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	364.87	454.74	553.43	623.51	712.29	715.56	737.86	741.62	791.97	850.86	1466.16
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.75	.61	.38	.30	.29	.28	.28	.23	.22	.20	.11

A.82

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 8-FT SHOULDER

2R-8-10

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 18 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 295.43
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	A	E	G3	C	B	G4W
VALUES	49.45	80.59	116.07	119.79	127.90	128.66	129.98	141.93	148.76	167.59	167.94
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	359.47	453.42	547.14	617.23	708.46	713.26	734.54	736.06	786.41	846.37	1460.41
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.77	.61	.40	.31	.30	.29	.29	.23	.22	.21	.12
-2											
STATE COST	G1	G2	A	C	B	F	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	A	THRIE	E	G3	C	B	G4W
VALUES	48.63	76.05	112.57	117.47	122.11	122.66	126.19	135.66	141.70	161.35	161.69
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	354.53	452.10	540.59	610.17	704.67	710.94	729.82	731.04	780.17	841.14	1454.13
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.79	.61	.41	.33	.30	.30	.29	.24	.24	.22	.12
-4											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	A	THRIE	E	G3	C	B	G4W
VALUES	47.31	71.60	108.88	115.10	115.40	116.71	122.43	128.93	133.87	154.43	154.77
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	350.08	450.78	533.88	602.34	700.91	708.57	722.91	727.35	773.25	835.19	1447.40
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.80	.61	.43	.34	.30	.30	.30	.25	.25	.23	.13
-6											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	A	THRIE	D	E	G3	C	B	G4W
VALUES	45.96	67.54	105.02	108.69	110.28	112.63	118.60	121.93	125.48	147.00	147.34
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	346.02	449.44	527.16	593.95	697.08	706.11	715.48	729.50	765.81	828.75	1440.41
BENEFIT/COST	G1	G2	A	C	D	G4S	E	B	THRIE	G4W	G3
VALUES	.82	.62	.45	.36	.31	.31	.31	.26	.26	.24	.13
-8											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	A	THRIE	D	E	G3	C	B	G4W
VALUES	44.57	63.66	101.03	102.15	103.76	109.98	114.56	114.98	116.95	139.41	139.74
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	342.13	448.05	520.63	585.43	693.04	703.45	707.88	719.50	758.21	822.24	1433.45
BENEFIT/COST	G1	G2	A	C	G4S	E	D	B	THRIE	G4W	G3
VALUES	.83	.62	.46	.38	.31	.31	.31	.27	.27	.25	.14

A.83

2R-8-12

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 8-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 20 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 262,62

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10 STATE COST	G1	G2	A	A	C	B	E	D	G4S	THR	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	D	G4S	THR	E	A	G3	C	B	G4W
VALUES	56.59	65.89	130.84	130.89	144.96	149.29	156.87	159.01	174.46	190.34	190.70
TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THR	G3
VALUES	344.36	460.07	575.35	642.94	724.31	727.77	749.36	758.81	809.17	863.43	1477.49
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THR	B	G4W	G3
VALUES	.71	.51	.25	.22	.21	.20	.19	.16	.13	.12	.08

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THR	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THR	E	A	G3	C	B	G4W
VALUES	55.25	62.99	128.24	128.72	142.39	145.44	151.88	156.24	170.21	186.60	186.96
TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THR	G3
VALUES	341.46	458.72	570.35	638.69	722.19	723.92	746.71	755.08	805.44	860.87	1474.72
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THR	B	G4W	G3
VALUES	.72	.51	.26	.23	.22	.20	.20	.17	.13	.12	.08

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THR	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THR	E	A	G3	C	B	G4W
VALUES	53.92	60.22	125.45	126.55	139.52	141.57	146.58	153.13	165.63	182.55	182.91
TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THR	G3
VALUES	338.70	457.39	565.05	634.11	720.03	720.05	743.93	751.02	801.38	857.99	1471.60
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THR	B	G4W	G3
VALUES	.73	.52	.28	.23	.22	.21	.21	.17	.14	.13	.08

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THR	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THR	E	A	G3	C	B	G4W
VALUES	52.59	57.63	122.51	124.34	136.22	137.69	140.94	149.56	160.61	178.04	178.45
TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THR	G3
VALUES	336.11	456.07	559.42	629.09	716.16	717.81	740.98	746.57	796.92	854.70	1468.04
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THR	B	G4W	G3
VALUES	.74	.52	.29	.23	.23	.22	.22	.18	.15	.14	.09

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THR	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THR	E	A	G3	C	B	G4W
VALUES	51.27	55.29	119.38	122.08	132.39	133.82	139.96	145.43	155.03	173.14	173.49
TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THR	G3
VALUES	333.76	454.74	553.43	623.51	712.29	715.56	737.86	741.62	791.97	850.86	1463.91
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THR	B	G4W	G3
VALUES	.74	.52	.31	.24	.23	.23	.22	.18	.16	.14	.09

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 8-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 20 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 262.62
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	A	E	G3	C	B	G4W
VALUES	49.95	53.27	116.07	119.79	127.90	128.66	129.98	140.62	148.76	167.59	167.94
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	331.75	453.42	547.14	617.23	708.46	713.26	734.54	736.06	786.41	846.37	1459.09
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.75	.53	.32	.24	.24	.24	.23	.19	.17	.15	.09
-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	A	THRIE	E	G3	C	B	G4W
VALUES	48.63	51.68	112.57	117.47	122.11	122.66	126.19	135.04	141.70	161.35	161.69
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	330.16	452.10	540.59	610.17	704.67	710.94	729.82	731.04	780.17	841.14	1459.51
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.76	.53	.34	.26	.24	.24	.24	.19	.18	.16	.10
-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	A	THRIE	E	G3	C	B	G4W
VALUES	47.31	50.55	108.88	115.10	115.40	116.71	122.43	128.72	133.87	154.43	154.77
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	329.02	450.78	533.88	602.34	700.91	708.57	722.91	727.35	773.25	835.19	1447.19
BENEFIT/COST	G1	G2	A	C	G4S	D	E	THRIE	B	G4W	G3
VALUES	.76	.53	.35	.27	.25	.25	.24	.20	.19	.17	.10
-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	A	THRIE	D	E	G3	C	B	G4W
VALUES	45.96	49.79	105.02	108.69	110.28	112.63	118.60	121.89	125.48	147.00	147.34
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	328.27	449.44	527.16	593.45	697.08	706.11	715.48	723.50	765.81	828.75	1440.36
BENEFIT/COST	G1	G2	A	C	G4S	D	E	THRIE	B	G4W	G3
VALUES	.76	.54	.37	.29	.25	.25	.25	.21	.20	.19	.11
-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	A	THRIE	D	E	G3	C	B	G4W
VALUES	44.57	49.24	101.03	102.15	103.76	109.98	114.56	114.97	116.95	139.41	139.74
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	327.72	448.05	520.63	585.43	693.04	703.45	707.88	719.50	758.21	822.24	1433.45
BENEFIT/COST	G1	G2	A	C	G4S	D	E	THRIE	B	G4W	G3
VALUES	.77	.54	.38	.31	.26	.26	.26	.22	.22	.20	.11

A.85

2R-8-12

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 10 FT

2R-10-0

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 10 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 177.50

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	D	G4S	THRIE	A	E	G3	G2	C	B	G4W	G1
VALUES	127.84	128.60	132.31	139.66	149.35	158.64	163.98	172.25	185.09	185.42	327.71
TOTAL COST	A	G2	G1	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	558.13	567.46	606.18	640.73	721.36	727.83	743.08	753.57	803.84	850.78	1477.17
BENEFIT/COST	A	D	G4S	THRIE	E	G2	G3	C	G4W	B	G1
VALUES	.09	.08	.08	.06	.05	.03	.01	.01	-.01	-.01	-.54
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	D	G4S	THRIE	A	E	G3	G2	C	B	G4W	G1
VALUES	124.41	124.77	130.36	136.18	144.10	154.27	157.30	167.19	180.43	180.75	324.14
TOTAL COST	A	G2	G1	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	554.65	560.77	602.62	635.67	717.88	722.57	743.24	748.91	794.23	848.83	1472.75
BENEFIT/COST	A	D	G4S	THRIE	E	G2	C	G3	B	G4W	G1
VALUES	.10	.09	.09	.07	.06	.05	.02	.02	-.01	-.01	-.53
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	A	E	G3	G2	C	B	G4W	G1
VALUES	120.96	121.02	128.23	132.54	138.84	149.73	150.13	161.84	175.57	175.84	320.30
TOTAL COST	A	G2	G1	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	551.02	553.60	548.77	630.37	714.50	717.37	739.44	744.05	794.37	846.71	1468.21
BENEFIT/COST	A	D	G4S	THRIE	G2	E	C	G3	A	G4W	G1
VALUES	.11	.10	.09	.07	.07	.07	.03	.02	.00	.00	-.51
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	A	E	G3	G2	C	B	G4W	G1
VALUES	117.17	117.73	125.84	128.64	133.75	142.36	145.01	156.30	170.47	170.79	316.11
TOTAL COST	G2	A	G1	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	545.84	547.17	544.54	624.78	711.20	712.23	735.64	738.45	784.27	844.31	1463.48
BENEFIT/COST	A	D	G4S	G2	E	THRIE	C	G3	B	G4W	G1
VALUES	.12	.10	.10	.04	.08	.07	.05	.02	.01	.01	-.50
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	A	E	G3	G2	C	B	G4W	G1
VALUES	113.37	114.55	123.05	124.53	128.73	133.85	140.03	150.35	165.07	165.38	311.44
TOTAL COST	G2	A	G1	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	537.33	543.01	584.47	618.82	707.21	708.02	731.85	733.55	783.86	841.52	1458.51
BENEFIT/COST	A	G2	D	G4S	E	THRIE	C	G3	B	G4W	G1
VALUES	.13	.11	.11	.10	.08	.08	.06	.03	.02	.02	-.48

A.86

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 10 FT

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 10 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 177.50
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1	2	3	4	5	6	7	8	9	10	11
n STATE COST										
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST										
G4S	D	THRIE	A	E	G2	G3	C	B	G4W	G1
VALUES	109.59	111.52	114.71	119.98	123.89	124.41	134.72	159.30	159.61	306.34
TOTAL COST										
G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	527.89	538.45	584.81	612.42	702.37	705.00	727.77	728.08	838.19	1453.19
BENEFIT/COST										
A	G2	D	G4S	E	THRIE	C	G3	B	G4W	G1
VALUES	.14	.13	.11	.11	.09	.08	.07	.03	.03	-.46
-2 STATE COST										
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST										
G4S	D	G2	A	THRIE	E	G3	C	B	G4W	G1
VALUES	105.86	108.72	113.81	114.93	115.66	119.35	128.98	137.00	153.09	300.50
TOTAL COST										
G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	517.28	533.41	578.98	605.47	697.83	702.20	721.57	724.33	834.14	1447.46
BENEFIT/COST										
G2	A	D	G4S	E	C	THRIE	B	G4W	G3	G1
VALUES	.16	.15	.12	.12	.10	.09	.09	.04	.04	-.44
-4 STATE COST										
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST										
G2	G4S	D	A	THRIE	E	G3	C	B	G4W	G1
VALUES	101.84	102.21	106.22	109.32	110.74	115.20	122.75	129.44	146.39	293.82
TOTAL COST										
G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	505.32	527.80	572.30	597.92	693.67	697.70	714.86	720.69	824.22	1441.23
BENEFIT/COST										
G2	A	G4S	D	E	C	THRIE	B	G4W	G3	G1
VALUES	.19	.16	.12	.12	.11	.10	.09	.05	.04	-.42
-6 STATE COST										
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST										
G2	G4S	A	D	THRIE	E	G3	C	B	G4W	G1
VALUES	88.56	98.63	103.13	103.99	104.93	111.41	116.00	121.26	139.18	286.17
TOTAL COST										
G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	492.04	521.60	564.64	589.74	689.89	697.47	707.66	717.10	823.41	1434.47
BENEFIT/COST										
G2	A	G4S	D	C	E	THRIE	B	G4W	G3	G1
VALUES	.22	.18	.13	.12	.12	.11	.10	.07	.05	-.39
-8 STATE COST										
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST										
G2	G4S	A	THRIE	D	E	G3	C	B	G4W	G1
VALUES	74.60	95.03	96.56	98.52	101.87	107.80	108.93	112.68	131.62	277.51
TOTAL COST										
G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	478.07	515.03	555.99	581.15	686.28	695.34	700.10	713.50	817.00	1427.40
BENEFIT/COST										
G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
VALUES	.26	.19	.14	.13	.13	.12	.11	.08	.05	-.36

A.87

2R-10-0

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 10-FT SHOULDER

2R-10-2

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 434.21

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THR1E	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THR1E	G3	D	C	A	E	G4S	B	G4W	G2	G1
	VALUES	184.43	238.44	250.12	254.93	280.90	317.33	317.44	346.45	346.77	361.39	449.10
	TOTAL COST	A	C	G1	G2	D	E	THR1E	B	G4S	G4W	G3
	VALUES	699.37	723.41	727.58	764.86	843.60	895.81	902.90	914.93	935.91	965.25	1556.92
	BENEFIT/COST	C	A	THR1E	D	E	G4S	G2	B	G3	G4W	G1
	VALUES	.38	.37	.35	.31	.20	.19	.18	.15	.15	.14	-.05

8	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THR1E	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THR1E	G3	D	C	A	G4S	E	B	G4W	G2	G1
	VALUES	177.86	232.14	243.36	247.39	277.82	312.39	312.52	342.05	342.37	356.65	449.06
	TOTAL COST	A	C	G1	G2	D	E	THR1E	B	G4S	G4W	G3
	VALUES	646.29	715.87	727.54	760.13	836.83	891.00	896.33	910.52	930.87	960.84	1550.62
	BENEFIT/COST	C	A	THR1E	D	E	G4S	G2	B	G3	G4W	G1
	VALUES	.40	.37	.36	.32	.21	.20	.19	.16	.15	.15	-.05

A.88

6	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THR1E	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THR1E	G3	D	C	A	G4S	E	B	G4W	G2	G1
	VALUES	171.06	225.17	236.05	239.10	274.13	306.76	307.21	336.91	337.23	351.15	449.02
	TOTAL COST	A	C	G1	G2	D	E	THR1E	B	G4S	G4W	G3
	VALUES	692.61	707.57	727.50	754.62	829.52	885.68	889.53	905.39	925.24	955.71	1543.64
	BENEFIT/COST	C	A	THR1E	D	E	G4S	G2	B	G3	G4W	G1
	VALUES	.42	.38	.37	.33	.22	.21	.21	.17	.16	.16	-.05

4	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THR1E	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THR1E	G3	D	C	A	G4S	E	B	G4W	G2	G1
	VALUES	163.99	217.35	228.06	229.90	269.66	300.38	301.25	330.85	331.16	344.66	448.98
	TOTAL COST	A	C	G1	G2	D	E	THR1E	B	G4S	G4W	G3
	VALUES	688.13	698.38	727.46	748.13	821.54	879.72	882.47	899.32	918.86	949.64	1535.83
	BENEFIT/COST	C	A	THR1E	D	E	G2	G4S	B	G4W	G3	G1
	VALUES	.44	.39	.38	.35	.23	.22	.22	.18	.17	.16	-.05

2	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THR1E	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THR1E	G3	D	C	A	G4S	E	B	G4W	G2	G1
	VALUES	156.60	208.46	219.22	219.58	264.14	293.03	294.46	323.58	323.89	336.89	448.95
	TOTAL COST	A	C	G1	G2	D	E	THR1E	B	G4S	G4W	G3
	VALUES	682.62	688.06	727.42	740.37	812.70	872.94	875.08	892.05	911.50	942.37	1526.94
	BENEFIT/COST	C	A	THR1E	D	E	G2	G4S	B	G4W	G3	G1
	VALUES	.46	.41	.39	.36	.24	.24	.23	.19	.18	.17	-.05

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 10-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 434.21

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0	STATE COST VALUES SOCIETAL COST VALUES TOTAL COST VALUES BENEFIT/COST VALUES	G1 278.48 148.82 675.73 48	G2 403.48 198.19 676.31 42	A 418.48 207.83 727.39 40	C 468.48 209.30 730.46 38	E 568.48 257.26 802.77 26	D 593.48 286.61 865.08 24	G4S 618.48 314.74 883.22 21	G4W 618.48 315.05 902.90 19	THRIE 718.48 327.48 933.53 18	G3 1318.48 448.92 1516.66 05
-2	STATE COST VALUES SOCIETAL COST VALUES TOTAL COST VALUES BENEFIT/COST VALUES	G1 278.48 140.57 662.76 51	G2 403.48 186.14 667.10 44	A 418.48 194.29 719.47 41	C 468.48 198.00 727.36 40	E 568.48 248.63 791.47 29	D 593.48 277.41 859.05 27	G4S 618.48 303.91 872.38 23	G4W 618.48 304.21 892.71 21	THRIE 718.48 315.99 922.69 19	G3 1318.48 448.89 1504.61 05
-4	STATE COST VALUES SOCIETAL COST VALUES TOTAL COST VALUES BENEFIT/COST VALUES	G1 278.48 131.78 647.10 55	G2 403.48 171.98 656.36 47	A 418.48 178.62 705.48 42	C 468.48 185.08 727.34 42	E 568.48 237.88 778.55 33	D 593.48 262.15 845.08 29	G4S 618.48 290.67 859.14 25	G4W 618.48 290.97 880.63 23	THRIE 718.48 302.00 909.45 20	G3 1318.48 448.87 1490.45 05
-6	STATE COST VALUES SOCIETAL COST VALUES TOTAL COST VALUES BENEFIT/COST VALUES	G1 278.48 122.43 629.33 58	G2 403.48 155.72 643.38 50	A 418.48 160.86 688.87 44	C 468.48 170.53 727.33 43	E 568.48 224.90 764.01 37	D 593.48 254.06 832.53 31	G4S 618.48 274.91 843.39 28	G4W 618.48 275.21 866.53 26	THRIE 718.48 285.40 893.69 21	G3 1318.48 448.85 1474.20 05
-8	STATE COST VALUES SOCIETAL COST VALUES TOTAL COST VALUES BENEFIT/COST VALUES	G1 278.48 112.77 610.32 62	G2 403.48 138.23 628.67 54	A 418.48 141.85 670.30 47	C 468.48 155.03 727.32 45	E 568.48 210.20 748.50 41	D 593.48 240.08 825.76 34	G4S 618.48 257.28 831.25 31	G4W 618.48 257.58 850.85 29	THRIE 718.48 266.82 876.05 22	G3 1318.48 448.84 1456.71 05

A.89

2R-10-2

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 10-FT SHOULDER

2R-10-4

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 380.06
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11
 PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10 STATE COST G1 G2 A C B E D G4W G4S THRIE G3
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST D G4S A THRIE G3 G2 C E G4W G1
 VALUES 130.64 131.14 139.66 140.68 158.64 163.98 172.25 190.28 190.54 190.60 404.17
 TOTAL COST A C G1 D G4S B E G4W THRIE G3
 VALUES 558.13 567.46 640.73 682.65 724.12 749.67 758.76 789.02 809.08 859.15 1477.17
 BENEFIT/COST A G2 C D G4S B THRIE E G4W G3
 VALUES .57 .54 .44 .42 .40 .33 .33 .33 .31 .17 -.09

8 STATE COST G1 G2 A C B E D G4W G4S THRIE G3
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST D G4S A THRIE G3 G2 C E B G4W G1
 VALUES 126.74 126.96 136.18 137.32 154.27 157.30 167.14 182.28 184.77 185.09 403.14
 TOTAL COST A C G1 D G4S B E G4W THRIE G3
 VALUES 554.65 560.77 635.67 681.62 720.21 745.44 753.24 760.76 803.57 855.80 1472.75
 BENEFIT/COST A G2 C D G4S B E THRIE G4W G3
 VALUES .58 .55 .45 .43 .41 .34 .34 .34 .32 .17 -.08

6 STATE COST G1 G2 A C B E D G4W G4S THRIE G3
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST D G4S A THRIE G3 G2 C E B G4W G1
 VALUES 122.79 122.95 132.54 133.81 149.73 150.13 161.89 174.01 179.11 179.42 402.03
 TOTAL COST A C G1 D G4S B E G4W THRIE G3
 VALUES 551.02 553.60 630.37 680.50 718.43 741.26 747.58 752.49 797.90 852.29 1468.21
 BENEFIT/COST A G2 C D G4S B THRIE G4W G3
 VALUES .59 .57 .47 .43 .42 .36 .35 .34 .32 .17 -.08

4 STATE COST G1 G2 A C B E D G4W G4S THRIE G3
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST D G4S A THRIE G3 G2 C E B G4W G1
 VALUES 118.66 119.30 128.69 130.08 142.36 145.01 156.30 165.77 173.26 173.57 400.81
 TOTAL COST A C G1 D G4S B E G4W THRIE G3
 VALUES 545.84 547.17 624.78 679.28 712.77 737.14 744.73 744.25 792.05 848.56 1463.48
 BENEFIT/COST A G2 C D G4S B THRIE G4W G3
 VALUES .60 .59 .48 .44 .42 .37 .36 .35 .33 .18 -.07

2 STATE COST G1 G2 A C B E D G4W G4S THRIE G3
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST D G4S A THRIE G3 G2 C E B G4W G1
 VALUES 114.58 115.80 124.53 126.04 133.85 140.03 150.35 157.64 167.18 167.49 399.46
 TOTAL COST A C G1 D G4S B E G4W THRIE G3
 VALUES 537.33 543.01 618.82 677.94 709.28 733.06 735.65 736.11 785.97 844.51 1458.51
 BENEFIT/COST A G2 C D G4S B THRIE G4W G3
 VALUES .61 .61 .49 .45 .43 .38 .37 .35 .34 .18 -.07

A.90

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 10-FT SHOULDER

2R-10-4

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 380.06
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	A	THRIE	G3	E	C	E	B	G4W	G1
VALUES	110.55	112.51	119.98	121.59	124.41	134.72	143.94	149.69	160.81	161.13	397.97
TOTAL COST	G2	A	C	G1	D	E	G4S	B	G4W	THRIE	G3
VALUES	527.89	538.45	612.42	676.45	705.98	728.17	729.03	729.29	779.60	840.06	1453.19
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3	G1
VALUES	.63	.62	.50	.45	.44	.40	.39	.36	.35	.19	-.06
-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	A	THRIE	G3	E	C	E	B	G4W	G1
VALUES	106.60	109.48	113.81	114.43	116.65	128.98	137.00	142.05	154.12	154.43	396.31
TOTAL COST	G2	A	C	G1	D	E	B	G4S	G4W	THRIE	G3
VALUES	517.28	533.41	605.47	674.28	702.95	720.53	722.59	725.08	772.90	835.12	1447.46
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3	G1
VALUES	.66	.63	.52	.46	.44	.41	.40	.37	.36	.19	-.06
-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	A	THRIE	G3	C	E	B	G4W	G1
VALUES	101.84	102.75	106.77	109.32	111.13	122.75	129.44	137.81	147.03	147.34	394.43
TOTAL COST	G2	A	C	G1	D	E	B	G4S	G4W	THRIE	G3
VALUES	505.32	527.80	597.92	672.91	700.24	713.29	715.51	721.23	765.81	829.61	1441.23
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THRIE	G3	G1
VALUES	.69	.65	.53	.46	.45	.42	.41	.38	.37	.20	-.05
-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	D	THRIE	G3	C	E	B	G4W	G1
VALUES	88.56	98.98	103.13	104.34	105.03	116.00	121.26	127.97	139.55	139.85	392.29
TOTAL COST	G2	A	C	G1	D	E	B	G4S	G4W	THRIE	G3
VALUES	492.04	521.60	589.74	670.76	697.81	706.44	708.02	717.45	758.32	823.50	1434.47
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THRIE	G3	G1
VALUES	.72	.66	.55	.46	.45	.44	.42	.39	.38	.20	-.04
-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	THRIE	D	G3	C	E	B	G4W	G1
VALUES	74.60	95.21	96.56	98.53	102.05	108.93	112.68	121.35	131.80	132.10	389.81
TOTAL COST	G2	A	C	G1	D	E	B	G4S	G4W	THRIE	G3
VALUES	478.07	515.03	581.15	668.29	695.53	694.82	700.28	713.69	750.58	817.01	1427.40
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THRIE	G3	G1
VALUES	.76	.68	.57	.47	.46	.45	.44	.40	.39	.21	-.04

A.91

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 10-FT SHOULDER

2R-10-6

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT

GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT

SOCIETAL COST WITH NO GUARDRAIL = \$ 334.21

AADT = 1000 GUARDRAIL LENGTH = 100 FT

OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	D	G4S	THRIE	A	E	G3	C	B	G4W	G1	
VALUES	62.32	127.84	128.60	132.31	147.20	149.35	158.75	164.15	177.27	177.59	280.22	
TOTAL COST	G2	G1	A	C	D	E	B	G4S	G4W	THRIE	G3	
VALUES	470.74	558.64	565.68	632.62	721.36	727.83	745.75	747.08	796.07	850.78	1477.22	
BENEFIT/COST	G2	A	C	D	G4S	E	THRIE	B	G4W	G1	G3	
VALUES	.66	.45	.36	.35	.33	.32	.28	.28	.25	.19	.13	

8	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	D	G4S	THRIE	A	E	G3	C	B	G4W	G1	
VALUES	63.45	124.41	124.77	130.36	142.41	144.10	154.30	160.49	173.96	174.28	278.63	
TOTAL COST	G2	G1	A	C	D	E	B	G4S	G4W	THRIE	G3	
VALUES	466.92	557.10	560.89	628.97	717.88	722.57	742.44	743.24	792.76	848.83	1472.78	
BENEFIT/COST	G2	A	C	D	G4S	E	THRIE	B	G4W	G1	G3	
VALUES	.67	.46	.37	.35	.34	.33	.28	.28	.26	.20	.14	

6	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	A	E	G3	C	B	G4W	G1	
VALUES	54.72	120.96	121.02	128.23	137.52	138.84	149.75	156.55	170.42	170.74	276.80	
TOTAL COST	G2	G1	A	C	D	E	B	G4S	G4W	THRIE	G3	
VALUES	463.19	555.27	555.94	625.03	714.50	717.37	738.84	739.44	789.21	846.71	1468.22	
BENEFIT/COST	G2	A	C	D	G4S	E	THRIE	B	G4W	G1	G3	
VALUES	.68	.47	.38	.36	.34	.34	.29	.29	.26	.21	.14	

4	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	A	E	G3	C	B	G4W	G1	
VALUES	56.14	117.17	117.73	125.84	132.46	133.75	145.01	152.26	166.57	166.88	274.66	
TOTAL COST	G2	A	G1	C	D	E	B	G4S	G4W	THRIE	G3	
VALUES	459.62	550.93	553.13	620.73	711.20	712.23	735.04	735.64	785.36	844.31	1463.49	
BENEFIT/COST	G2	A	C	D	G4S	E	THRIE	B	G4W	G1	G3	
VALUES	.69	.48	.39	.36	.35	.35	.29	.29	.27	.21	.14	

2	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	A	E	G3	C	B	G4W	G1	
VALUES	52.77	113.37	114.55	123.05	127.18	128.73	140.03	147.50	162.32	162.64	272.11	
TOTAL COST	G2	A	G1	C	D	E	B	G4S	G4W	THRIE	G3	
VALUES	456.24	545.65	550.54	615.98	707.21	708.02	730.80	731.85	781.11	841.52	1458.51	
BENEFIT/COST	G2	A	C	D	G4S	E	THRIE	B	G4W	G1	G3	
VALUES	.70	.49	.40	.37	.36	.36	.30	.29	.28	.22	.15	

A.92

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 10-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 334.21
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	A	E	G3	C	B	G4W	G1
	VALUES	49.65	109.59	111.52	119.71	121.64	123.89	134.72	142.16	157.58	157.89	269.05
	TOTAL COST	G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	453.13	540.11	547.53	610.63	702.37	705.00	726.05	728.07	776.36	838.19	1453.20
	BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1	G3
	VALUES	.71	.51	.41	.38	.36	.36	.31	.30	.29	.23	.15

-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	A	E	G3	C	B	G4W	G1
	VALUES	46.88	105.86	108.72	115.66	115.80	119.35	128.98	136.06	152.19	152.49	265.31
	TOTAL COST	G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	450.36	534.28	543.79	604.54	697.83	702.20	720.66	724.33	770.97	834.14	1447.46
	BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1	G3
	VALUES	.71	.52	.42	.38	.37	.37	.32	.30	.29	.25	.16

A.93

-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	A	E	G3	C	B	G4W	G1
	VALUES	44.55	102.21	106.22	109.66	110.74	115.20	122.75	129.07	146.03	146.34	260.73
	TOTAL COST	G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	448.02	528.14	539.21	597.55	693.67	699.70	714.51	720.69	764.81	829.22	1441.23
	BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1	G3
	VALUES	.72	.54	.44	.38	.38	.38	.33	.31	.30	.26	.16

-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	A	D	THRIE	E	G3	C	B	G4W	G1
	VALUES	42.64	98.63	103.21	103.99	104.93	111.41	116.00	121.18	139.10	139.39	255.17
	TOTAL COST	G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	446.12	521.69	533.64	589.65	689.89	697.47	707.57	717.10	757.87	823.41	1434.47
	BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1	G3
	VALUES	.72	.55	.45	.39	.39	.38	.34	.32	.31	.28	.17

-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	A	THRIE	D	E	G3	C	B	G4W	G1
	VALUES	41.05	95.03	96.56	98.52	101.87	107.80	108.93	112.67	131.61	131.91	248.59
	TOTAL COST	G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	444.52	515.04	527.06	581.14	686.28	695.34	700.09	713.50	750.38	817.00	1427.40
	BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1	G3
	VALUES	.73	.57	.47	.39	.39	.39	.36	.33	.33	.31	.17

2R-10-6

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 10-FT SHOULDER

2R-10-8

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 18 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 295.43
 AOT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1 2 3 4 5 6 7 8 9 10 11

10	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	D	G4S	THRIE	E	A	G3	C	B	G4W
	VALUES	61.65	119.78	120.78	132.31	141.92	147.03	153.32	164.31	171.23	177.42
	TOTAL COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
	VALUES	449.71	465.12	565.50	632.79	713.26	720.40	739.25	745.57	850.78	1471.80
	BENEFIT/COST	G2	G1	A	D	G4S	C	E	THRIE	B	G3
	VALUES	.58	.45	.35	.30	.28	.28	.27	.23	.19	.11

8	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	D	G4S	THRIE	E	A	G3	C	B	G4W
	VALUES	58.74	117.71	118.30	130.36	138.00	142.32	149.79	160.58	164.28	173.87
	TOTAL COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
	VALUES	442.76	462.22	560.80	629.05	711.18	716.48	736.78	742.35	848.83	1468.26
	BENEFIT/COST	G2	G1	A	D	C	G4S	E	THRIE	B	G3
	VALUES	.59	.47	.37	.30	.29	.29	.27	.23	.20	.11

6	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	D	G4S	THRIE	E	A	G3	C	B	G4W
	VALUES	55.91	115.68	115.81	128.23	134.06	137.48	146.08	156.59	156.87	170.38
	TOTAL COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
	VALUES	435.35	459.38	555.95	625.07	709.16	712.54	734.28	738.85	846.71	1464.55
	BENEFIT/COST	G2	G1	A	D	C	G4S	E	THRIE	B	G3
	VALUES	.59	.50	.38	.30	.30	.29	.28	.23	.20	.11

4	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	C	B	G4W
	VALUES	53.16	113.26	113.68	125.84	130.11	132.44	142.13	148.91	152.27	166.55
	TOTAL COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
	VALUES	427.39	456.63	550.92	620.75	707.16	708.59	731.74	735.03	844.31	1460.61
	BENEFIT/COST	G2	G1	A	D	C	G4S	E	THRIE	B	G3
	VALUES	.60	.53	.39	.31	.31	.29	.29	.24	.21	.12

2	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	C	B	G4W
	VALUES	50.51	110.63	111.70	123.05	126.18	127.17	137.85	140.25	147.51	162.32
	TOTAL COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
	VALUES	418.72	453.99	545.65	615.98	704.65	705.18	729.10	730.80	841.11	1456.33
	BENEFIT/COST	G2	G1	A	C	D	G4S	E	THRIE	B	G3
	VALUES	.61	.56	.40	.32	.31	.30	.29	.24	.21	.12

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 10-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 18 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 295.43

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

OF CURVE	1	2	3	4	5	6	7	8	9	10	11	
0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	A	E	G1	G3	C	B	G4W
	VALUES	48.03	107.87	109.74	119.71	121.63	122.30	130.71	133.15	142.16	157.57	157.89
	TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	409.18	451.50	540.11	610.63	700.77	703.21	726.05	726.35	776.36	838.14	1451.62
	BENEFIT/COST	G2	G1	A	C	D	G4S	E	THRIE	B	G4W	G3
	VALUES	.61	.59	.42	.33	.31	.30	.30	.24	.24	.22	.12
-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	A	E	G1	G3	C	B	G4W
	VALUES	45.78	104.96	107.74	115.66	115.80	118.51	120.06	127.92	136.06	152.19	152.49
	TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	398.54	449.26	534.28	604.54	696.99	701.26	720.66	723.43	770.97	834.14	1446.40
	BENEFIT/COST	G1	G2	A	C	D	G4S	E	B	THRIE	G4W	G3
	VALUES	.63	.62	.43	.34	.32	.31	.31	.25	.25	.23	.13
-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	G1	A	THRIE	E	G3	C	B	G4W
	VALUES	43.86	101.86	105.86	108.13	109.66	110.74	114.87	122.08	129.07	146.03	146.34
	TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	386.61	447.33	528.14	597.55	693.34	699.33	714.51	720.33	764.81	829.22	1440.56
	BENEFIT/COST	G1	G2	A	C	D	G4S	E	B	THRIE	G4W	G3
	VALUES	.67	.62	.44	.36	.32	.31	.31	.26	.26	.24	.13
-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	A	THRIE	E	D	G3	C	B	G4W
	VALUES	42.25	94.96	98.54	103.21	103.90	104.93	111.33	115.62	121.18	139.10	139.39
	TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	373.44	445.72	521.69	589.65	689.81	697.38	707.57	717.02	757.87	823.41	1434.09
	BENEFIT/COST	G1	G2	A	C	D	G4S	E	B	THRIE	G4W	G3
	VALUES	.72	.63	.46	.37	.32	.32	.32	.28	.27	.25	.14
-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	A	THRIE	D	E	G3	C	B	G4W
	VALUES	40.85	81.18	95.02	96.56	98.52	101.86	107.79	108.74	112.67	131.61	131.91
	TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	359.65	444.33	515.04	581.14	686.27	695.33	700.09	713.50	750.38	817.00	1427.21
	BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G4W	G3
	VALUES	.77	.63	.48	.39	.33	.32	.32	.29	.27	.26	.14

A.95

A.95

2R-10-8

2R-10-10

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 10-FT SHOULDER

PAVEMENT-10-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-10-OBSTACLE DISTANCE = 10 FT

PAVEMENT-10-OBSTACLE DISTANCE = 20 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 262.62

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
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10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	D	G4S	THRIE	E	A	G3	C	B	G4W
VALUES	53.12	114.69	119.60	120.60	132.31	141.92	147.03	153.32	164.31	177.10	177.42
TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	393.17	456.60	565.50	632.79	713.08	720.40	739.08	745.57	795.89	850.78	1471.80
BENEFIT/COST	G1	G2	A	D	G4S	C	E	THRIE	B	G4W	G3
VALUES	.53	.52	.28	.24	.23	.21	.21	.18	.15	.14	.08

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	D	G4S	THRIE	E	A	G3	C	B	G4W
VALUES	51.70	107.71	117.61	118.21	130.36	138.00	142.32	149.79	160.58	173.87	174.14
TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	386.18	455.17	560.80	629.05	711.09	716.48	736.68	742.35	792.67	848.83	1468.26
BENEFIT/COST	G1	G2	A	D	G4S	C	E	THRIE	B	G4W	G3
VALUES	.56	.52	.29	.24	.23	.22	.22	.18	.16	.14	.09

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	D	G4S	THRIE	E	A	G3	C	B	G4W
VALUES	50.29	100.78	115.64	115.76	128.23	134.06	137.48	146.08	156.59	170.38	170.70
TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	379.26	453.77	555.95	625.07	709.11	712.54	734.24	738.85	789.17	846.71	1464.55
BENEFIT/COST	G1	G2	A	D	G4S	C	E	THRIE	B	G4W	G3
VALUES	.58	.53	.30	.25	.24	.23	.22	.19	.16	.15	.09

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	D	G4S	THRIE	E	A	G3	C	B	G4W
VALUES	48.90	93.98	113.25	113.67	125.84	130.11	132.44	142.13	152.27	166.55	166.87
TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	372.46	452.37	550.92	620.75	707.14	708.59	731.72	735.03	785.34	844.31	1460.61
BENEFIT/COST	G1	G2	A	D	G4S	C	E	THRIE	B	G4W	G3
VALUES	.61	.53	.31	.25	.24	.24	.23	.19	.17	.15	.09

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	D	G4S	THRIE	E	A	G3	C	B	G4W
VALUES	47.52	87.37	110.62	111.70	123.05	126.18	127.17	137.85	147.51	162.32	162.63
TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
VALUES	365.85	450.99	545.65	615.98	704.65	705.17	729.10	730.80	781.11	841.52	1456.33
BENEFIT/COST	G1	G2	A	D	G4S	C	E	THRIE	B	G4W	G3
VALUES	.63	.53	.32	.25	.25	.25	.24	.19	.18	.16	.09

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 10-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 20 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 262.62
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA												
DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11	
0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	A	E	G3	C	B	G4W
	VALUES	46.15	81.07	107.87	109.74	119.71	121.63	122.30	133.15	142.16	157.57	157.84
	TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	359.55	449.63	540.11	610.63	700.77	703.21	726.05	726.34	776.36	838.19	1451.62
	BENEFIT/COST	G1	G2	A	D	C	G4S	E	THRIE	B	G4W	G3
VALUES	.65	.54	.34	.26	.26	.25	.24	.20	.18	.17	.10	
-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	A	E	G3	C	B	G4W
	VALUES	44.80	75.22	104.96	107.79	115.66	115.80	118.51	127.92	136.06	152.19	152.49
	TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	353.70	448.27	534.28	604.54	696.99	701.26	720.66	723.43	770.97	834.14	1446.40
	BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.67	.54	.35	.27	.26	.25	.25	.20	.19	.18	.10	
-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	A	THRIE	E	G3	C	B	G4W
	VALUES	43.47	69.96	101.86	105.86	109.66	110.74	114.87	122.08	129.07	146.03	146.34
	TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	348.44	446.94	528.14	597.55	693.34	699.33	714.51	720.33	764.81	829.22	1440.56
	BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.69	.54	.37	.29	.26	.26	.26	.21	.21	.19	.11	
-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	A	D	THRIE	E	G3	C	B	G4W
	VALUES	42.16	65.31	98.54	103.21	103.90	104.93	111.33	115.62	121.18	139.10	139.39
	TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	343.79	445.63	521.69	589.65	689.81	697.38	707.57	717.02	757.87	823.41	1434.09
	BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.71	.55	.38	.30	.27	.27	.26	.22	.22	.20	.11	
-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	A	THRIE	D	E	G3	C	B	G4W
	VALUES	40.84	61.11	95.02	96.56	98.52	101.86	107.79	108.74	112.67	131.61	131.91
	TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	339.59	444.32	515.04	581.14	686.27	695.33	700.09	713.50	750.38	817.00	1427.21
	BENEFIT/COST	G1	G2	A	C	G4S	D	E	THRIE	B	G4W	G3
VALUES	.72	.55	.40	.32	.27	.27	.27	.23	.23	.21	.12	

A.97

2R-10-10

2R-10-12

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 10-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 22 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 234.81

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10	STATE COST	G1	G2	A	B	C	D	E	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	D	G4S	THRIE	E	A	G3	B	G4W
	VALUES	53.12	63.30	119.60	120.60	132.31	141.92	145.08	147.03	164.31	177.42
	TOTAL COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
	VALUES	341.78	456.60	565.50	632.79	713.08	720.40	739.08	745.57	850.78	1463.55
	BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W
	VALUES	.62	.45	.21	.19	.18	.15	.14	.10	.09	.07

8	STATE COST	G1	G2	A	B	C	D	E	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	D	G4S	THRIE	E	A	G3	B	G4W
	VALUES	51.70	60.06	117.61	118.21	130.36	138.00	142.32	142.97	160.58	173.87
	TOTAL COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
	VALUES	338.53	455.17	560.80	629.05	711.09	716.48	736.68	742.35	848.83	1461.44
	BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W
	VALUES	.63	.45	.22	.20	.19	.17	.15	.11	.10	.07

6	STATE COST	G1	G2	A	B	C	D	E	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	D	G4S	THRIE	E	A	G3	B	G4W
	VALUES	50.29	56.49	115.64	115.76	128.23	134.06	137.48	140.64	156.59	170.70
	TOTAL COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
	VALUES	335.46	453.77	555.95	625.07	709.11	712.54	734.34	738.85	846.71	1459.12
	BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W
	VALUES	.64	.46	.23	.20	.19	.17	.15	.11	.10	.07

4	STATE COST	G1	G2	A	B	C	D	E	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	D	G4S	THRIE	E	A	G3	B	G4W
	VALUES	48.90	54.12	113.25	113.67	125.84	130.11	132.44	138.01	152.27	166.55
	TOTAL COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
	VALUES	332.60	452.37	550.92	620.75	707.14	708.59	731.72	735.03	844.31	1456.49
	BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W
	VALUES	.65	.46	.24	.20	.20	.18	.15	.12	.11	.07

2	STATE COST	G1	G2	A	B	C	D	E	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	D	G4S	THRIE	E	A	G3	B	G4W
	VALUES	47.52	51.50	110.62	111.70	123.05	126.18	127.17	134.96	147.51	162.32
	TOTAL COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
	VALUES	329.97	450.99	545.65	615.98	704.65	705.17	729.10	730.80	841.11	1453.43
	BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W
	VALUES	.66	.46	.26	.21	.20	.19	.16	.13	.12	.08

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 10-FT SHOULDER

2R-10-12

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 22 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 234.81
 ADOT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	A	E	G3	C	B	G4W
	VALUES	46.15	44.17	107.87	109.74	119.71	121.63	122.30	131.33	142.16	157.57	157.89
	TOTAL COST	G1	G2	A	C	D	D	B	G4S	G4W	THRIE	G3
	VALUES	327.65	444.63	540.11	610.63	700.77	703.21	726.05	726.34	776.36	838.14	1444.81
	BENEFIT/COST	G1	G2	A	D	G4S	C	E	THRIE	B	G4W	G3
	VALUES	.67	.47	.27	.21	.21	.20	.19	.16	.14	.12	.08
-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	A	E	G3	C	B	G4W
	VALUES	44.80	47.25	104.96	107.79	115.66	115.80	118.51	126.97	136.06	152.19	152.49
	TOTAL COST	G1	G2	A	C	D	D	B	G4S	G4W	THRIE	G3
	VALUES	325.73	448.27	534.28	604.54	696.99	701.26	720.66	723.43	770.97	834.14	1445.44
	BENEFIT/COST	G1	G2	A	D	C	G4S	E	THRIE	B	G4W	G3
	VALUES	.67	.47	.28	.21	.21	.21	.20	.17	.15	.13	.08
-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	A	E	G3	C	B	G4W
	VALUES	43.47	45.82	101.86	105.86	109.66	110.74	114.87	121.71	129.07	146.03	146.34
	TOTAL COST	G1	G2	A	C	D	D	B	G4S	G4W	THRIE	G3
	VALUES	324.30	446.44	528.14	597.55	693.34	699.33	714.51	720.33	764.81	829.22	1440.18
	BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
	VALUES	.68	.47	.30	.23	.22	.21	.21	.17	.16	.14	.09
-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	A	D	THRIE	E	G3	C	B	G4W
	VALUES	42.16	44.88	98.54	103.21	103.90	104.93	111.33	115.53	121.18	139.10	139.39
	TOTAL COST	G1	G2	A	C	D	D	B	G4S	G4W	THRIE	G3
	VALUES	323.36	445.63	521.69	589.65	689.81	697.38	707.57	717.02	757.87	823.41	1434.00
	BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
	VALUES	.68	.48	.31	.24	.22	.22	.21	.18	.17	.15	.09
-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	A	THRIE	D	E	G3	C	B	G4W
	VALUES	40.84	44.30	95.02	96.56	98.52	101.86	107.79	108.73	112.67	131.61	131.91
	TOTAL COST	G1	G2	A	C	D	D	B	G4S	G4W	THRIE	G3
	VALUES	322.77	444.32	515.04	581.14	686.27	695.33	700.09	713.50	750.38	817.00	1427.20
	BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
	VALUES	.68	.48	.33	.26	.23	.22	.22	.19	.18	.17	.10

A.99

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 12 FT

2R-12-0

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 154.74
 ADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
10	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S
VALUES	278.48	403.48	418.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48
SOCIETAL COST	D	THRIE	G4S	A	E	G3	G3	G2	C	B
VALUES	118.71	119.57	119.92	119.92	129.38	142.76	142.33	159.09	162.06	172.58
TOTAL COST	A	G2	G1	C	D	D	E	G4S	B	G4W
VALUES	547.85	562.57	578.99	578.99	630.54	712.18	721.24	738.40	741.06	838.05
BENEFIT/COST	D	A	G4S	THRIE	E	G3	G2	G2	C	G4W
VALUES	.06	.06	.06	.06	.05	.02	.01	-.01	-.02	-.03
										-.52

8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S
VALUES	278.48	403.48	418.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48
SOCIETAL COST	D	THRIE	G4S	A	E	G3	G3	G2	C	B
VALUES	114.99	115.93	117.92	117.92	126.02	137.42	142.98	153.21	157.37	168.24
TOTAL COST	A	G2	G1	C	D	D	E	G4S	B	G4W
VALUES	544.49	556.68	576.02	576.02	625.85	708.46	715.90	734.41	736.72	836.39
BENEFIT/COST	A	D	G4S	THRIE	E	G3	G2	G2	C	G4W
VALUES	.07	.07	.06	.06	.05	.03	.01	.00	-.01	-.02
										-.51

6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S
VALUES	278.48	403.48	418.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48
SOCIETAL COST	D	THRIE	G4S	A	E	G3	G3	G2	C	B
VALUES	111.40	112.03	116.19	116.19	122.60	132.10	138.61	146.85	152.48	163.73
TOTAL COST	A	G2	G1	C	D	D	E	G4S	B	G4W
VALUES	541.08	550.32	572.81	572.81	620.96	704.88	710.57	730.51	732.20	834.67
BENEFIT/COST	A	D	G4S	THRIE	E	G2	G3	G3	C	G4W
VALUES	.08	.07	.07	.07	.05	.04	.02	.01	.00	-.01
										-.50

4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S
VALUES	278.48	403.48	418.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48
SOCIETAL COST	D	THRIE	G4S	A	E	G3	G3	G2	C	B
VALUES	107.98	108.23	114.33	114.33	119.09	126.84	134.18	139.93	147.37	159.03
TOTAL COST	A	G2	G1	C	D	D	E	G4S	B	G4W
VALUES	537.56	543.40	569.31	569.31	615.84	701.46	705.31	726.71	727.50	832.81
BENEFIT/COST	A	D	G4S	THRIE	E	G2	C	C	G3	G4W
VALUES	.09	.08	.08	.08	.06	.05	.04	.02	.02	-.01
										-.49

2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S
VALUES	278.48	403.48	418.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48
SOCIETAL COST	D	THRIE	G4S	A	E	G3	G3	G2	C	B
VALUES	104.54	104.74	112.22	112.22	115.42	121.68	129.65	132.33	141.96	154.09
TOTAL COST	A	G2	G1	C	D	D	E	B	G4S	G4W
VALUES	533.89	535.80	565.47	565.47	610.44	698.22	700.16	722.57	723.02	830.70
BENEFIT/COST	A	D	G4S	THRIE	E	G2	C	C	G3	B
VALUES	.09	.08	.08	.08	.06	.06	.03	.00	.00	-.47

A.100

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 12 FT

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 154.74
 ADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	A	E	G2	G3	C	B	G4W	G1
VALUES	100.96	101.73	104.73	111.50	116.69	123.87	124.93	136.20	148.86	149.14	282.73
TOTAL COST	G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	527.35	529.97	561.20	604.68	645.17	645.20	717.34	719.43	767.62	828.20	1443.41
BENEFIT/COST	A	D	G4S	G2	E	THRIE	C	G3	B	G4W	G1
VALUES	.10	.09	.09	.08	.07	.06	.04	.02	.01	.01	-.46

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	A	E	G2	G3	C	B	G4W	G1
VALUES	97.48	98.97	106.66	107.21	111.96	114.32	119.91	129.97	143.25	143.53	277.91
TOTAL COST	G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	517.80	525.68	556.39	598.44	640.43	642.45	711.73	715.96	762.00	825.14	1438.39
BENEFIT/COST	A	D	G4S	G2	E	THRIE	C	G3	B	G4W	G1
VALUES	.11	.10	.09	.09	.07	.07	.05	.03	.02	.02	-.44

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	A	E	G2	G3	C	B	G4W	G1
VALUES	94.14	96.56	102.40	102.80	103.36	107.59	114.46	123.13	137.17	137.44	272.40
TOTAL COST	G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	506.84	520.87	550.87	591.61	686.07	690.03	705.64	712.62	755.92	821.27	1432.93
BENEFIT/COST	G2	A	D	G4S	E	THRIE	C	B	G3	G4W	G1
VALUES	.13	.13	.10	.10	.08	.07	.07	.03	.03	.03	-.42

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	A	THRIE	E	G3	C	B	G4W	G1
VALUES	90.71	90.91	94.50	96.91	97.92	103.69	108.40	115.57	130.49	130.76	266.01
TOTAL COST	G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	494.19	515.39	544.48	584.04	682.16	687.98	698.97	709.98	749.23	816.40	1426.88
BENEFIT/COST	G2	A	G4S	D	E	C	THRIE	B	G4W	G3	G1
VALUES	.16	.14	.10	.10	.09	.08	.08	.04	.04	.04	-.40

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	THRIE	D	E	G3	C	B	G4W	G1
VALUES	76.45	87.67	90.68	92.02	92.70	100.14	101.68	107.23	123.18	123.45	258.63
TOTAL COST	G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	479.92	509.16	537.10	575.70	678.62	686.18	691.66	706.15	741.92	810.50	1420.16
BENEFIT/COST	G2	A	G4S	D	C	E	THRIE	B	G4W	G3	G1
VALUES	.19	.15	.11	.10	.10	.09	.04	.06	.05	.04	-.37

A.101

2R-12-0

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 12-FT SHOULDER

2R-12-2

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 380.06

ADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	G3	D	C	A	E	G4S	B	G4W	G2	G1
	VALUES	177.13	223.28	239.74	241.92	251.67	292.49	292.96	317.06	317.34	327.58	391.65
	TOTAL COST	G1	A	C	G2	D	E	B	THRIE	G4S	G4W	G3
	VALUES	670.13	670.14	710.39	731.06	833.21	870.96	885.53	895.60	911.43	935.82	1541.75
	BENEFIT/COST	A	C	THRIE	D	E	G4S	G2	G3	B	G4W	G1
	VALUES	.31	.29	.28	.24	.15	.14	.13	.12	.11	.10	-.04

8	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	G3	D	C	A	E	G4S	B	G4W	G2	G1
	VALUES	170.98	218.11	233.94	235.73	249.53	280.57	288.91	313.91	314.19	324.27	391.61
	TOTAL COST	A	G1	C	G2	D	E	B	THRIE	G4S	G4W	G3
	VALUES	668.00	670.08	704.20	727.74	827.42	867.04	882.38	889.46	907.38	932.67	1536.59
	BENEFIT/COST	A	C	THRIE	D	E	G4S	G2	G3	B	G4W	G1
	VALUES	.31	.31	.29	.25	.16	.15	.14	.12	.12	.11	-.04

A.102

6	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	G3	D	C	A	E	G4S	B	G4W	G2	G1
	VALUES	164.59	212.36	227.64	228.82	246.99	284.27	284.43	310.21	310.49	320.40	391.56
	TOTAL COST	A	G1	C	G2	D	E	B	THRIE	G4S	G4W	G3
	VALUES	665.47	670.04	697.29	723.87	821.12	862.75	878.68	883.06	902.91	928.46	1530.83
	BENEFIT/COST	C	A	THRIE	D	E	G4S	G2	G3	B	G4W	G1
	VALUES	.32	.32	.30	.26	.17	.15	.15	.13	.12	.11	-.04

4	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	G3	D	C	A	E	G4S	B	G4W	G2	G1
	VALUES	157.93	205.88	220.74	221.04	243.92	278.40	279.50	305.80	306.08	315.82	391.53
	TOTAL COST	A	G1	C	G2	D	E	B	THRIE	G4S	G4W	G3
	VALUES	662.40	670.00	689.52	719.29	814.22	857.98	874.27	876.40	897.88	924.55	1524.36
	BENEFIT/COST	C	A	THRIE	D	E	G4S	G2	G3	B	G4W	G1
	VALUES	.34	.33	.31	.27	.17	.16	.16	.13	.13	.12	-.04

2	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	G3	D	C	A	E	G4S	B	G4W	G2	G1
	VALUES	150.96	198.50	212.23	213.09	240.11	273.65	274.12	300.46	300.74	310.29	391.49
	TOTAL COST	A	G1	C	G2	D	E	B	THRIE	G4S	G4W	G3
	VALUES	658.59	669.96	680.71	713.77	806.56	852.59	868.93	869.44	892.13	919.21	1516.97
	BENEFIT/COST	C	A	THRIE	D	E	G2	G4S	B	G3	G4W	G1
	VALUES	.36	.33	.32	.28	.18	.17	.17	.14	.14	.13	-.04

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 380.06
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	B	G4W	G2	G1
VALUES	143.63	189.92	202.12	204.47	235.29	266.94	267.91	293.88	294.16	304.50	391.46
TOTAL COST	A	G1	C	G2	D	E	B	THRIE	G4S	G4W	G3
VALUES	653.77	669.93	670.60	706.97	797.95	846.39	862.10	862.35	885.41	912.63	1508.40
BENEFIT/COST	C	A	THRIE	D	E	G2	G4S	B	G3	G4W	G1
VALUES	.38	.35	.33	.30	.19	.19	.18	.15	.14	.14	-.04
-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	B	G4W	G2	G1
VALUES	135.85	179.76	190.34	194.61	229.06	258.92	260.62	285.63	285.90	294.99	391.43
TOTAL COST	A	C	G1	G2	D	E	B	THRIE	G4S	G4W	G3
VALUES	647.54	658.81	669.90	698.47	788.08	839.09	854.10	854.32	877.40	904.38	1498.23
BENEFIT/COST	C	A	THRIE	D	G2	E	G4S	B	G4W	G3	G1
VALUES	.40	.36	.34	.31	.21	.21	.20	.17	.15	.15	-.04
-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	B	G4W	G2	G1
VALUES	127.50	167.51	176.41	183.11	220.94	249.19	251.88	275.16	275.43	284.22	391.41
TOTAL COST	A	C	G1	G2	D	E	B	THRIE	G4S	G4W	G3
VALUES	639.42	644.89	669.88	687.69	776.59	830.36	843.63	845.98	867.66	893.91	1485.99
BENEFIT/COST	C	A	THRIE	D	G2	E	G4S	B	G4W	G3	G1
VALUES	.43	.38	.35	.33	.24	.22	.21	.18	.17	.16	-.04
-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	B	G4W	G2	G1
VALUES	118.48	152.72	159.92	169.64	210.44	237.30	241.34	261.94	262.21	270.61	391.39
TOTAL COST	C	A	G1	G2	D	E	B	THRIE	G4S	G4W	G3
VALUES	628.39	628.92	669.87	674.09	763.11	819.82	830.41	836.95	855.78	880.68	1471.20
BENEFIT/COST	C	A	THRIE	D	G2	E	G4S	B	G4W	G3	G1
VALUES	.47	.41	.36	.35	.27	.24	.23	.21	.19	.17	-.04
-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	B	G4W	G2	G1
VALUES	108.78	135.48	140.97	154.25	197.46	223.17	228.89	245.91	246.18	254.11	391.38
TOTAL COST	C	A	G2	G1	D	E	B	THRIE	G4S	G4W	G3
VALUES	609.44	615.93	657.58	669.86	747.73	807.37	814.39	827.25	841.65	864.65	1453.95
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1
VALUES	.51	.44	.38	.38	.31	.26	.25	.24	.22	.19	-.04

A.103

2R-12-2

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 12-FT SHOULDER

2R-12-4

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 334,21

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	D	G4S	THRIE	A	G3	G2	C	B	G4W	E	G1
VALUES	122.30	123.33	129.21	129.38	147.33	154.04	162.06	178.99	174.28	187.86	357.77
TOTAL COST	A	G2	C	G1	D	G4S	B	E	G4W	THRIE	G3
VALUES	547.85	562.57	630.54	636.25	715.78	741.81	742.47	766.34	797.25	847.68	1465.80
BENEFIT/COST	A	G2	C	D	G4S	THRIE	B	E	G4W	G3	G1
VALUES	.49	.43	.37	.36	.34	.29	.27	.25	.25	.14	-.08

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	D	G4S	THRIE	A	G3	G2	C	B	G4W	E	G1
VALUES	118.11	118.91	126.00	126.02	142.98	153.21	157.37	173.71	173.99	179.78	357.13
TOTAL COST	A	G2	C	G1	D	G4S	B	E	G4W	THRIE	G3
VALUES	544.49	556.68	625.85	635.61	711.59	737.38	742.18	758.26	792.46	844.48	1461.46
BENEFIT/COST	A	G2	C	D	G4S	THRIE	B	E	G4W	G3	G1
VALUES	.50	.45	.38	.36	.35	.29	.28	.27	.26	.15	-.08

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	D	G4S	THRIE	A	G3	G2	C	B	G4W	E	G1
VALUES	114.08	114.59	122.60	122.74	138.61	146.85	152.48	168.29	168.57	171.55	356.43
TOTAL COST	A	G2	C	G1	D	G4S	B	E	G4W	THRIE	G3
VALUES	541.08	550.32	620.96	634.91	707.56	733.07	736.76	750.02	787.04	841.22	1457.08
BENEFIT/COST	A	G2	C	D	G4S	THRIE	B	E	G4W	G3	G1
VALUES	.51	.46	.39	.37	.36	.29	.29	.28	.27	.15	-.08

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	D	G4S	THRIE	A	G3	G2	C	B	G4W	E	G1
VALUES	110.24	110.41	119.09	119.39	134.18	139.93	147.37	162.73	163.01	163.21	355.66
TOTAL COST	A	G2	C	G1	D	G4S	B	E	G4W	THRIE	G3
VALUES	537.56	543.40	615.84	634.14	703.71	728.88	731.20	741.69	781.48	837.87	1452.66
BENEFIT/COST	A	G2	C	D	G4S	B	THRIE	E	G4W	G3	G1
VALUES	.51	.48	.40	.38	.36	.30	.30	.30	.28	.15	-.08

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	D	G4S	THRIE	A	G3	G2	C	B	G4W	E	G1
VALUES	106.35	106.61	115.42	115.89	129.65	132.33	141.96	154.83	157.00	157.28	354.82
TOTAL COST	A	G2	C	G1	D	G4S	B	E	G4W	THRIE	G3
VALUES	533.84	535.80	610.44	633.29	700.09	724.83	725.47	733.31	775.75	834.37	1448.12
BENEFIT/COST	A	G2	C	D	G4S	B	E	THRIE	G4W	G3	G1
VALUES	.52	.50	.41	.38	.37	.31	.31	.30	.29	.16	-.07

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 12-FT SHOULDER

2R-12-4

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 334.21

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	A	THRIE	G2	G3	C	E	B	G4W	G1
VALUES	102.43	103.23	111.50	112.14	123.87	124.93	136.20	146.50	151.05	151.33	353.88
TOTAL COST	G2	A	C	G1	D	B	E	E	G4W	THRIE	G3
VALUES	527.35	529.97	604.68	632.36	696.71	719.53	720.91	724.98	769.80	830.62	1443.41
BENEFIT/COST	A	G2	C	D	G4S	E	B	THRIE	G4W	G3	G1
VALUES	.53	.52	.42	.39	.37	.32	.32	.31	.30	.16	-.07
-2											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	A	THRIE	G2	G3	C	E	B	G4W	G1
VALUES	98.66	100.16	107.21	108.03	114.32	119.91	129.97	138.33	144.82	145.09	352.83
TOTAL COST	G2	A	C	G1	D	B	E	E	G4W	THRIE	G3
VALUES	517.80	525.68	598.44	631.31	693.63	713.29	716.81	717.13	763.57	826.50	1438.39
BENEFIT/COST	G1	A	C	D	G4S	E	B	THRIE	G4W	G3	G1
VALUES	.54	.54	.44	.39	.38	.34	.33	.31	.31	.16	-.07
-4											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	A	G2	THRIE	G3	C	E	B	G4W	G1
VALUES	95.02	97.44	102.40	103.36	103.40	114.46	123.13	130.48	138.21	138.48	351.65
TOTAL COST	G2	A	C	G1	D	B	E	E	G4W	THRIE	G3
VALUES	506.84	520.87	591.61	630.12	690.91	706.69	708.96	713.50	756.96	821.88	1432.93
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3	G1
VALUES	.57	.55	.45	.40	.39	.35	.34	.32	.32	.17	-.06
-6											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	A	THRIE	G3	C	E	B	G4W	G1
VALUES	90.71	91.51	95.10	96.91	98.09	108.40	115.57	123.06	131.13	131.40	350.29
TOTAL COST	G2	A	C	G1	D	B	E	E	G4W	THRIE	G3
VALUES	494.19	515.39	584.04	628.77	688.58	699.61	701.54	709.99	749.87	816.57	1426.88
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3	G1
VALUES	.60	.57	.47	.40	.39	.37	.36	.33	.33	.17	-.06
-8											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	A	THRIE	G3	C	E	B	G4W	G1
VALUES	76.45	88.02	90.68	92.04	93.05	101.68	107.23	116.06	123.53	123.80	348.71
TOTAL COST	G2	A	C	G1	D	B	E	E	G4W	THRIE	G3
VALUES	479.92	509.16	575.70	627.18	686.52	692.01	694.54	706.50	742.27	810.52	1420.16
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THRIE	G3	G1
VALUES	.64	.58	.48	.41	.40	.38	.37	.34	.34	.18	-.05

A.105

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 12-FT SHOULDER

2R-12-6

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 18 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 295.43
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	D	THRIE	G4S	A	E	C	B	G4W	G1
VALUES	66.81	118.71	119.57	119.92	138.13	142.76	147.42	152.65	163.50	247.78
TOTAL COST	G2	G1	A	C	D	E	B	G4S	THRIE	G3
VALUES	470.28	526.26	556.61	621.13	712.18	721.24	731.97	738.40	838.05	1465.89
BENEFIT/COST	G2	A	C	D	G4S	E	THRIE	B	G1	G3
VALUES	.57	.38	.30	.30	.28	.26	.24	.23	.21	.11

8 STATE COST	G1	G2	A	C	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	D	THRIE	THRIE	A	E	C	B	G4W	G1
VALUES	62.62	114.99	115.93	117.92	133.31	137.42	143.03	149.54	160.68	246.63
TOTAL COST	G2	G1	A	C	D	E	B	G4S	THRIE	G3
VALUES	466.10	525.10	551.28	618.02	708.46	715.90	729.16	734.41	836.39	1461.51
BENEFIT/COST	G2	A	C	D	G4S	E	THRIE	B	G1	G3
VALUES	.58	.39	.31	.30	.29	.27	.25	.24	.22	.12

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6 STATE COST	G1	G2	A	C	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	D	G4S	THRIE	A	E	C	B	G4W	G1
VALUES	58.56	111.40	112.03	116.19	128.46	132.10	138.63	146.19	157.65	245.33
TOTAL COST	G2	G1	A	C	D	E	B	G4S	THRIE	G3
VALUES	462.04	523.81	546.94	614.66	704.88	710.57	726.13	730.51	834.67	1457.11
BENEFIT/COST	G2	A	C	D	G4S	E	THRIE	B	G1	G3
VALUES	.59	.40	.32	.31	.30	.28	.25	.24	.22	.12

4 STATE COST	G1	G2	A	C	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	D	G4S	THRIE	A	E	C	B	G4W	G1
VALUES	54.68	107.98	108.23	114.33	123.59	126.84	134.19	142.53	154.35	243.84
TOTAL COST	G2	G1	A	C	D	E	B	G4S	THRIE	G3
VALUES	458.15	522.32	542.07	611.00	701.46	705.31	722.83	726.71	832.81	1452.67
BENEFIT/COST	G2	A	C	D	G4S	E	THRIE	B	G1	G3
VALUES	.60	.41	.33	.32	.30	.29	.25	.25	.23	.12

2 STATE COST	G1	G2	A	C	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	A	E	C	B	G4W	G1
VALUES	51.00	104.54	104.74	112.22	118.67	121.68	129.65	138.47	150.72	242.09
TOTAL COST	G2	G1	A	C	D	E	B	G4S	THRIE	G3
VALUES	454.47	520.57	537.15	606.45	698.22	700.16	719.19	723.02	830.70	1448.13
BENEFIT/COST	G2	A	C	D	G4S	E	THRIE	B	G1	G3
VALUES	.61	.42	.34	.32	.31	.30	.25	.25	.23	.13

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 18 FT

GAARDT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA							
	1	2	3	4	5	6	7	8
1								
2								
3								
4								
5								
6								
7								
8								

	G1	G2	A	C	B	E	D	G4W	G4S	THRIE
0 STATE COST										
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	583.48	618.48	618.48	718.48
SOCIETAL COST	G2	G4S	D	THRIE	A		G3	C	B	G4W
VALUES	42.57	100.96	101.73	109.73	113.63	116.69	124.93	133.90	146.65	146.92
TOTAL COST	G2	G1	A	C	E	D	B	G4S	G4W	THRIE
VALUES	451.05	518.46	532.11	602.38	695.17	695.20	715.12	719.43	765.40	828.20
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G1	G3
VALUES	61	43	34	33	31	31	26	26	4	13

[illegible]

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	G1	G2	A	C	B	E	D	G4W	G4S	THRIE
-4 STATE COST										
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48
SOCIAL COST	G2	G4S	D	THRIE	A	E	G4W	C	B	G4W
VALUES	41.78	46.14	46.56	102.80	102.93	107.59	114.46	122.56	136.61	136.89
TOTAL COST	G2	G1	A	C	E	D	B	G4S	G4W	THRIE
VALUES	45.25	512.63	521.41	511.04	686.07	690.03	705.09	712.62	755.36	821.27
BENEFIT/COST	G2	A	C	D	G4S	E	B			
VALUES	.63	.46	.37	.34	.33	.32	.28	.27	.26	.22

	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
-6. STATE COST											
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	583.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	A	THRIE	A	G3	C	B	G4W	G1
VALUES	39.57	90.91	94.50	97.06	97.92	103.69	108.40	115.40	130.33	130.60	230.06
TOTAL COST	G1	G1	A	C	E	B	B	G4S	G4W	THRIE	G3
VALUES	493.05	508.53	515.54	583.88	682.16	687.88	688.81	709.38	749.08	816.40	1426.88
BENEFIT/COST	G2	A	C	D	E	G4S	B				
VALUES	.63	.47	.38	.34	.33	.23	.29	.27	.27	.23	.14

-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIAL COST	G2	G4S	A	THRIE	D	E	G3	C	B	G1	
	VALUES	37.78	87.67	90.70	92.02	92.70	100.14	101.68	107.21	123.16	123.43	224.99
	TOTAL COST	G2	G1	A	C	E	D	B	G4S	G4W	THRIE	G3
	VALUES	441.25	503.46	509.18	575.68	678.62	686.18	691.64	706.15	741.90	810.50	1420.16
	BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1	G3
	VALUES	.64	.49	.40	.34	.34	.34	.30	.28	.28	.25	.15

2R-12-6

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 12-FT SHOULDER

2R-12-8

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 20 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 262.62

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	D	G4S	THRIE	E	A	G3	C	G4W	G1
	VALUES	59.75	109.30	110.84	119.57	134.05	137.84	140.69	152.93	163.21	166.19
	TOTAL COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
	VALUES	444.67	463.23	556.32	621.41	702.77	712.52	729.31	731.69	838.05	1459.16
	BENEFIT/COST	G2	G1	A	D	G4S	C	E	THRIE	B	G3
	VALUES	.50	.35	.30	.26	.25	.23	.22	.20	.17	.09

8	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	D	G4S	THRIE	E	A	G3	C	G4W	G1
	VALUES	56.66	107.16	108.37	117.92	130.25	133.14	137.32	149.70	159.99	160.80
	TOTAL COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
	VALUES	438.46	460.13	551.61	618.18	700.63	708.72	726.85	728.99	836.39	1455.80
	BENEFIT/COST	G2	G1	A	D	G4S	C	E	THRIE	B	G3
	VALUES	.51	.37	.31	.26	.25	.24	.23	.20	.18	.10

6	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	D	G4S	THRIE	E	A	G3	C	G4W	G1
	VALUES	53.63	105.11	105.95	116.19	126.38	128.38	133.89	146.27	153.34	157.85
	TOTAL COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
	VALUES	431.81	457.11	546.85	614.74	698.58	704.85	724.43	726.05	834.67	1452.36
	BENEFIT/COST	G2	G1	A	D	G4S	C	E	THRIE	B	G3
	VALUES	.52	.39	.32	.27	.25	.25	.24	.20	.18	.10

4	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	D	G4S	THRIE	E	A	G3	C	G4W	G1
	VALUES	50.69	103.14	103.56	114.33	122.47	123.56	130.35	142.56	146.16	154.60
	TOTAL COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
	VALUES	424.64	454.17	542.03	611.03	696.61	700.94	722.04	722.80	832.81	1448.83
	BENEFIT/COST	G2	G1	A	D	G4S	C	E	THRIE	B	G3
	VALUES	.53	.42	.33	.27	.26	.26	.24	.21	.19	.10

2	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	D	G4S	THRIE	E	A	G3	C	G4W	G1
	VALUES	47.88	101.17	101.25	112.22	118.54	118.66	126.64	138.35	138.48	150.99
	TOTAL COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
	VALUES	416.82	451.36	537.13	606.96	694.73	697.02	719.18	719.65	830.70	1445.12
	BENEFIT/COST	G2	G1	A	D	G4S	C	E	THRIE	B	G3
	VALUES	.53	.45	.34	.27	.26	.26	.25	.21	.20	.10

A.108

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 12-FT SHOULDER

2R-12-8

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 20 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 262.62

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
0	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	A	E	G3	G1	C	G4W
VALUES	45.23	98.74	99.43	109.73	113.63	114.63	122.67	129.73	133.91	146.92
TOTAL COST	G1	G2	A	C	D	E	B	G4S	G4W	THRIE
VALUES	408.20	448.70	532.11	602.38	692.40	693.11	715.12	717.22	765.40	828.20
BENEFIT/COST	G2	G1	A	D	C	G4S	E	THRIE	B	G4W
VALUES	.54	.48	.36	.27	.27	.26	.26	.21	.20	.11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
-2	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	A	E	G3	G1	C	G4W
VALUES	42.79	96.23	97.67	106.66	108.42	110.79	118.30	120.07	128.67	142.27
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE
VALUES	398.54	446.27	526.89	597.14	689.27	691.15	710.48	714.71	760.75	825.14
BENEFIT/COST	G2	G1	A	C	D	G4S	E	THRIE	B	G4W
VALUES	.54	.51	.37	.29	.28	.27	.26	.22	.21	.11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
-4	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	A	E	G1	G3	C	G4W
VALUES	40.66	93.59	95.98	102.80	102.93	107.08	109.07	113.38	122.56	136.89
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE
VALUES	387.54	444.14	521.41	591.04	685.56	689.46	705.09	712.06	755.36	821.27
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W
VALUES	.55	.55	.38	.30	.28	.27	.27	.22	.22	.11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
-6	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	A	E	THRIE	E	C	B
VALUES	38.89	90.75	94.34	96.45	97.06	97.92	103.54	107.74	115.40	130.33
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE
VALUES	374.93	442.36	515.54	583.88	682.02	687.81	698.81	709.23	749.08	816.40
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W
VALUES	.60	.55	.40	.31	.28	.28	.28	.23	.23	.12

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
-8	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	1318.48
SOCIETAL COST	G2	G1	G4S	A	THRIE	D	E	G3	C	B
VALUES	37.41	82.31	87.65	90.70	92.02	92.68	100.12	101.32	107.21	123.16
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE
VALUES	360.78	440.88	509.18	575.68	678.60	686.15	691.64	706.13	741.90	810.50
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W
VALUES	.65	.56	.41	.33	.29	.28	.28	.25	.24	.12

A.109

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 12-FT SHOULDER

2R-12-10

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 22 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 234,81

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1 2 3 4 5 6 7 8 9 10 11

10	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	D	G4S	G1	THRIE	E	A	G3	C	B	G4W
	VALUES	49.85	109.00	110.54	117.33	119.57	134.05	137.84	140.64	152.93	163.21	163.50
	TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
	VALUES	395.80	453.33	556.32	621.41	702.48	712.52	729.02	731.69	781.97	838.05	1458.16
	BENEFIT/COST	G2	G1	A	D	G4S	C	E	THRIE	B	G4W	G3
	VALUES	.46	.42	.23	.21	.20	.17	.17	.16	.13	.12	.07

8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	D	G4S	G1	THRIE	E	A	G3	C	B	G4W
	VALUES	48.42	106.99	108.21	110.26	117.92	130.25	133.14	137.32	149.70	160.52	160.80
	TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
	VALUES	388.73	451.90	551.61	618.18	700.47	708.72	726.68	728.99	779.28	836.39	1455.80
	BENEFIT/COST	G2	G1	A	D	G4S	C	E	THRIE	B	G4W	G3
	VALUES	.46	.45	.24	.22	.20	.18	.18	.16	.13	.12	.07

A.110

6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	D	G4S	THRIE	E	A	G3	C	B	G4W
	VALUES	47.01	103.14	105.02	105.87	116.19	126.38	128.38	133.89	146.27	157.57	157.85
	TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
	VALUES	381.61	450.48	546.85	614.74	698.50	704.85	724.35	726.05	776.33	834.67	1452.36
	BENEFIT/COST	G1	G2	A	D	G4S	C	E	THRIE	B	G4W	G3
	VALUES	.47	.47	.25	.22	.21	.19	.19	.17	.14	.12	.08

4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	D	G4S	THRIE	E	A	G3	C	B	G4W
	VALUES	45.60	96.03	103.10	103.53	114.33	122.47	123.56	130.35	142.56	154.32	154.60
	TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
	VALUES	374.50	449.08	542.03	611.03	696.58	700.94	722.00	722.80	773.08	832.81	1448.83
	BENEFIT/COST	G1	G2	A	D	G4S	C	E	THRIE	B	G4W	G3
	VALUES	.50	.47	.27	.22	.21	.20	.19	.17	.14	.13	.08

2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	D	G4S	THRIE	E	A	G3	C	B	G4W
	VALUES	44.21	89.00	101.16	101.24	112.22	118.54	118.66	126.64	138.48	150.71	150.99
	TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
	VALUES	367.48	447.68	537.13	606.96	694.71	697.02	719.18	719.63	769.46	830.70	1445.12
	BENEFIT/COST	G1	G2	A	D	G4S	C	E	THRIE	B	G4W	G3
	VALUES	.52	.47	.28	.23	.22	.21	.20	.17	.15	.14	.08

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 12-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 22 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 234.81

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	A	E	G3	C	B	G4W
VALUES	42.81	82.15	98.74	99.43	109.73	113.63	114.63	122.67	133.41	146.64	146.92
TOTAL COST	G1	G2	A	C	D	E	B	G4S	G4W	THRIE	G3
VALUES	360.63	445.29	532.11	602.38	692.90	693.11	715.12	717.21	765.40	828.20	1441.14
BENEFIT/COST	G1	G2	A	D	G4S	C	E	THRIE	B	G4W	G3
VALUES	.55	.48	.29	.23	.22	.22	.21	.17	.16	.14	.09
-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	A	E	G3	C	B	G4W
VALUES	41.43	75.61	96.23	97.67	106.66	108.42	110.79	118.30	128.67	142.00	142.27
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	354.09	444.90	526.89	597.14	689.27	691.15	710.48	714.70	760.75	825.14	1436.77
BENEFIT/COST	G1	G2	A	D	C	G4S	E	THRIE	B	G4W	G3
VALUES	.57	.48	.30	.23	.23	.22	.21	.18	.16	.15	.09
-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	A	E	G3	C	B	G4W
VALUES	40.06	69.56	93.59	95.98	102.80	102.93	107.08	113.38	122.56	136.61	136.89
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	348.04	443.53	521.41	591.04	685.56	689.46	705.09	712.06	755.36	821.27	1431.86
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.59	.48	.32	.24	.23	.23	.22	.18	.17	.16	.09
-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	A	E	G3	C	B	G4W
VALUES	38.71	64.14	90.75	94.34	97.06	97.92	103.54	107.74	115.40	130.33	130.60
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	342.62	442.19	515.54	583.88	682.02	687.81	698.81	709.23	749.08	816.40	1426.22
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.61	.49	.33	.25	.24	.23	.23	.19	.18	.17	.10
-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	A	E	G3	C	B	G4W
VALUES	37.38	59.32	87.65	90.70	92.02	92.68	100.12	101.32	107.21	123.16	123.43
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	337.80	440.86	509.18	575.68	678.60	686.15	691.64	706.13	741.90	810.50	1419.80
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.63	.49	.34	.27	.24	.24	.23	.20	.20	.18	.10

A.III

2R-12-10

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 12-FT SHOULDER

2R-12-12

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 24 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 211.16

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

10	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	D	G4S	THRIE	G3	E	A	C	B	G4W
	VALUES	49.85	61.61	109.00	110.54	119.57	131.12	134.05	137.84	152.93	163.21	163.50
	TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
	VALUES	340.09	453.33	556.32	621.41	702.48	712.52	729.02	731.69	781.97	838.05	1449.59
	BENEFIT/COST	G1	G2	A	D	G4S	E	THRIE	C	B	G4W	G3
	VALUES	.54	.40	.18	.17	.16	.13	.13	.12	.08	.08	.06

8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	D	G4S	THRIE	G3	E	A	C	B	G4W
	VALUES	48.42	57.95	106.99	108.21	117.92	129.36	130.25	133.14	149.70	160.52	160.80
	TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
	VALUES	336.43	451.90	551.61	618.18	700.47	708.72	726.68	728.99	779.28	836.39	1447.83
	BENEFIT/COST	G1	G2	A	D	G4S	E	THRIE	C	B	G4W	G3
	VALUES	.55	.40	.19	.18	.17	.14	.13	.13	.09	.08	.06

6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	D	G4S	THRIE	E	G3	A	C	B	G4W
	VALUES	47.01	54.49	105.02	105.87	116.19	126.38	127.48	128.38	146.27	157.57	157.85
	TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
	VALUES	332.97	450.48	546.85	614.74	698.50	704.85	724.35	726.05	776.33	834.67	1445.96
	BENEFIT/COST	G1	G2	A	D	G4S	E	THRIE	C	B	G4W	G3
	VALUES	.56	.41	.20	.18	.17	.15	.14	.13	.09	.09	.06

4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	D	G4S	THRIE	E	A	G3	C	B	G4W
	VALUES	45.60	51.26	103.10	103.53	114.33	122.47	123.56	125.43	142.56	154.32	154.60
	TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
	VALUES	329.74	449.08	542.03	611.03	694.58	700.94	722.00	722.80	773.08	832.81	1443.90
	BENEFIT/COST	G1	G2	A	D	G4S	E	THRIE	C	B	G4W	G3
	VALUES	.57	.41	.21	.18	.17	.15	.15	.13	.10	.09	.07

2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	D	G4S	THRIE	E	A	G3	C	B	G4W
	VALUES	44.21	48.30	101.16	101.24	112.22	118.54	118.66	123.09	138.48	150.71	150.99
	TOTAL COST	G1	G2	A	C	D	E	G4S	B	G4W	THRIE	G3
	VALUES	326.78	447.68	537.13	606.96	694.71	697.02	719.18	719.63	769.46	830.70	1441.56
	BENEFIT/COST	G1	G2	A	D	G4S	E	THRIE	C	B	G4W	G3
	VALUES	.58	.41	.22	.19	.18	.16	.16	.14	.11	.10	.07

A.112

SUMMARY OF RESULTS

2-LANE RURAL ROAD WITH 12-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 24 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 211.16
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA													
DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11		
0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3	
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48	
	SOCIETAL COST	G2	G1	G4S	D	THRIE	A	E	G3	C	B	G4W	
	VALUES	42.81	45.66	48.74	99.43	109.73	113.63	114.63	120.33	133.91	146.64	146.92	
	TOTAL COST	G1	G2	A	C	D	E	B	G4S	G4W	THRIE	G3	
VALUES	324.14	446.29	532.11	607.38	692.40	693.11	715.12	717.21	765.40	828.20	1438.81		
	BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3	
	VALUES	.59	.42	.23	.19	.18	.17	.16	.14	.11	.10	.07	
	-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
		VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST		G2	G1	G4S	D	THRIE	A	E	G3	C	B	G4W	
VALUES		41.43	43.41	46.23	97.67	106.66	108.42	110.79	116.98	128.67	142.00	142.27	
TOTAL COST		G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3	
VALUES	321.89	444.90	526.89	597.14	689.27	691.15	710.48	714.70	760.75	825.14	1435.45		
	BENEFIT/COST	G1	G2	A	D	G4S	C	E	THRIE	B	G4W	G3	
	VALUES	.60	.42	.25	.19	.19	.18	.17	.15	.12	.11	.07	
	-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
		VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST		G2	G1	G4S	D	THRIE	A	E	G3	C	B	G4W	
VALUES		40.06	41.65	43.59	95.98	102.80	102.93	107.08	112.80	122.56	136.61	136.89	
TOTAL COST		G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3	
VALUES	320.13	443.53	521.41	591.04	685.56	689.46	705.09	712.06	755.36	821.27	1431.27		
	BENEFIT/COST	G1	G2	A	D	G4S	C	E	THRIE	B	G4W	G3	
	VALUES	.61	.42	.26	.19	.19	.19	.18	.15	.13	.12	.07	
	-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
		VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST		G2	G1	G4S	D	A	THRIE	E	G3	C	B	G4W	
VALUES		38.71	40.45	40.75	94.34	97.06	97.92	103.54	107.58	115.40	130.33	130.60	
TOTAL COST		G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3	
VALUES	318.92	442.19	515.54	593.88	682.02	687.81	698.81	709.23	749.08	816.40	1426.05		
	BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3	
	VALUES	.61	.43	.27	.20	.20	.19	.19	.16	.14	.13	.08	
	-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
		VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST		G2	G1	G4S	A	THRIE	D	E	G3	C	B	G4W	
VALUES		37.38	39.72	37.65	90.70	92.02	92.68	100.12	101.30	107.21	123.16	123.43	
TOTAL COST		G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3	
VALUES	318.20	440.86	509.18	575.68	678.60	686.15	691.64	706.13	741.90	810.50	1419.77		
	BENEFIT/COST	G1	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	
	VALUES	.62	.43	.29	.22	.20	.20	.19	.17	.15	.14	.08	

A.113

2R-12-12

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 3 FT

4R-3-0

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 3 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 151.14
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

OF CURVE	1	2	3	4	5	6	7	8	9	10	11	
10	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	D	E	A	C	G3	B	G4W	G1
	VALUES	69.20	76.04	78.08	81.05	81.30	83.30	86.12	93.59	100.97	101.19	195.13
	TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	472.68	473.60	501.77	554.60	659.77	669.44	674.53	694.51	719.66	796.56	1412.07
	BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
	VALUES	.20	.16	.14	.12	.12	.12	.10	.09	.08	.04	-.16
8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	D	E	A	C	G3	B	G4W	G1
	VALUES	65.33	73.62	74.51	79.16	79.67	80.10	82.78	89.87	97.95	98.17	190.01
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	468.49	469.81	498.58	551.25	658.14	666.43	672.64	692.10	716.65	792.99	1408.34
	BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
	VALUES	.21	.17	.15	.13	.12	.12	.11	.09	.09	.05	-.14
6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	THRIE	G4S	A	D	E	C	G3	B	G4W	G1
	VALUES	61.42	70.85	71.01	76.75	77.08	77.86	79.28	85.94	94.79	95.00	184.45
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	462.93	464.89	495.22	547.76	656.33	663.26	670.55	689.49	713.48	789.33	1404.42
	BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
	VALUES	.22	.18	.15	.13	.13	.12	.11	.10	.09	.05	-.12
4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	THRIE	G4S	A	D	E	C	G3	B	G4W	G1
	VALUES	57.63	67.20	68.22	73.30	74.79	75.70	75.85	81.89	91.53	91.75	178.47
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	456.94	461.10	491.77	544.18	654.32	660.01	668.27	686.70	710.22	785.67	1400.37
	BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
	VALUES	.23	.19	.16	.13	.13	.13	.12	.10	.10	.05	-.10
2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	THRIE	G4S	A	D	E	C	G3	B	G4W	G1
	VALUES	54.17	63.68	65.26	69.86	72.15	72.94	73.61	77.80	88.26	88.47	172.10
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	450.58	457.65	488.33	540.62	652.08	656.74	665.77	683.74	706.95	782.16	1396.28
	BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
	VALUES	.24	.19	.17	.14	.13	.13	.12	.11	.10	.06	-.08

A.114

A.114

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 3 FT

4R-3-0

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 3 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 151.19

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
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0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THR1E	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THR1E	G4S	A	C	D	E	G3	B	G4W	G1
VALUES	51.25	60.44	62.16	66.53	68.70	69.57	71.12	73.79	85.07	85.27	165.42
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THR1E	G3
VALUES	443.90	454.72	485.00	537.18	649.60	653.54	663.04	680.63	703.75	778.91	1384.26
BENEFIT/COST	G2	A	C	G4S	E	D	THR1E	B	G4W	G3	G1
VALUES	.25	.20	.18	.14	.14	.14	.13	.12	.11	.06	-.05

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THR1E	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THR1E	G4S	A	C	D	E	G3	B	G4W	G1
VALUES	48.97	57.55	58.94	63.37	65.45	66.63	68.39	69.92	82.00	82.20	158.53
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THR1E	G3
VALUES	437.00	452.45	481.85	533.93	646.87	650.47	660.10	677.41	700.67	776.02	1388.39
BENEFIT/COST	G2	A	C	G4S	E	D	THR1E	B	G4W	G3	G1
VALUES	.25	.21	.18	.15	.14	.14	.13	.12	.11	.06	-.03

A.115

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THR1E	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THR1E	G4S	A	C	D	E	G3	B	G4W	G1
VALUES	47.29	55.01	55.64	60.40	62.39	63.52	65.44	66.21	79.06	79.26	151.50
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THR1E	G3
VALUES	429.98	450.76	478.88	530.86	643.92	647.54	657.00	674.12	697.74	773.48	1384.68
BENEFIT/COST	G2	A	C	G4S	E	D	THR1E	B	G4W	G3	G1
VALUES	.26	.22	.19	.15	.15	.15	.13	.13	.12	.06	-.00

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THR1E	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THR1E	A	C	D	E	G3	B	G4W	G1
VALUES	45.93	52.35	52.69	57.58	59.46	60.37	62.40	62.63	76.23	76.43	144.47
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THR1E	G3
VALUES	422.94	449.40	478.06	527.94	640.88	647.71	653.84	670.82	694.90	771.17	1381.11
BENEFIT/COST	G2	A	C	G4S	E	D	THR1E	B	G4W	G3	G1
VALUES	.26	.22	.20	.16	.15	.15	.14	.13	.12	.07	.02

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THR1E	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THR1E	A	C	D	E	G3	B	G4W	G1
VALUES	44.56	49.26	50.47	54.91	56.66	57.40	59.21	59.52	73.52	73.72	137.61
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THR1E	G3
VALUES	416.08	448.04	473.39	525.14	637.99	642.00	650.88	667.74	692.19	768.44	1372.69
BENEFIT/COST	G2	A	C	G4S	E	D	THR1E	B	G4W	G3	G1
VALUES	.26	.23	.20	.16	.16	.16	.14	.14	.13	.07	.05

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 3-FT SHOULDER

4R-3-2

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 5 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 360.55

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

10 STATE COST		G1		G2		A		C		B		D		G4W		G4S		THRIE		G3	
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	G2	E	G2	E	G2	E	G2	E	G2	E	G2	E	G2	
VALUES	88.79	107.01	111.08	112.04	156.58	157.89	162.82	163.23	163.23	163.23	163.23	163.23	163.23	163.23	163.23	163.23	163.23	163.23	163.23	163.23	
TOTAL COST	G2	A	C	G1	D	E	B	G4S	E	G2	E	G2	E	G2	E	G2	E	G2	E	G2	
VALUES	566.71	575.05	575.48	651.23	705.52	741.29	746.66	776.37	796.89	807.27	807.27	807.27	807.27	807.27	807.27	807.27	807.27	807.27	807.27	807.27	
BENEFIT/COST	C	G2	A	D	THRIE	E	G4S	B	G4W	G3	G3	G3	G3	G3	G3	G3	G3	G3	G3	G3	
VALUES	.54	.49	.49	.42	.38	.34	.33	.32	.29	.19	.19	.19	.19	.19	.19	.19	.19	.19	.19	.19	

8 STATE COST		G1		G2		A		C		B		D		G4W		G4S		THRIE		G3	
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	G2	E	G2	E	G2	E	G2	E	G2	E	G2	E	G2	
VALUES	85.42	101.22	105.02	107.01	148.50	150.05	153.75	155.53	155.53	155.53	155.53	155.53	155.53	155.53	155.53	155.53	155.53	155.53	155.53	155.53	
TOTAL COST	G2	A	C	G1	D	E	B	G4S	E	G2	E	G2	E	G2	E	G2	E	G2	E	G2	
VALUES	557.23	566.98	569.70	651.18	700.49	734.00	738.24	768.53	788.51	803.90	803.90	803.90	803.90	803.90	803.90	803.90	803.90	803.90	803.90	803.90	
BENEFIT/COST	C	G2	A	D	THRIE	E	G4S	B	G4W	G3	G3	G3	G3	G3	G3	G3	G3	G3	G3	G3	
VALUES	.55	.51	.51	.43	.38	.35	.34	.33	.31	.19	.19	.19	.19	.19	.19	.19	.19	.19	.19	.19	

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6 STATE COST		G1		G2		A		C		B		D		G4W		G4S		THRIE		G3	
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	G2	E	G2	E	G2	E	G2	E	G2	E	G2	E	G2	
VALUES	81.90	95.35	98.84	101.87	139.96	141.76	143.85	147.77	161.02	161.23	161.23	161.23	161.23	161.23	161.23	161.23	161.23	161.23	161.23	161.23	
TOTAL COST	G2	A	C	G1	D	E	B	G4S	E	G2	E	G2	E	G2	E	G2	E	G2	E	G2	
VALUES	547.32	558.44	563.82	651.13	695.35	726.25	729.49	760.23	779.71	800.37	800.37	800.37	800.37	800.37	800.37	800.37	800.37	800.37	800.37	800.37	
BENEFIT/COST	C	G2	A	D	THRIE	E	G4S	B	G4W	G3	G3	G3	G3	G3	G3	G3	G3	G3	G3	G3	
VALUES	.57	.54	.53	.44	.39	.37	.35	.35	.32	.20	.20	.20	.20	.20	.20	.20	.20	.20	.20	.20	

4 STATE COST		G1		G2		A		C		B		D		G4W		G4S		THRIE		G3	
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	G2	E	G2	E	G2	E	G2	E	G2	E	G2	E	G2	
VALUES	78.29	89.61	92.79	96.79	131.12	133.15	133.72	139.67	152.00	152.21	152.21	152.21	152.21	152.21	152.21	152.21	152.21	152.21	152.21	152.21	
TOTAL COST	G2	A	C	G1	D	E	B	G4S	E	G2	E	G2	E	G2	E	G2	E	G2	E	G2	
VALUES	537.19	549.60	558.08	651.07	690.26	718.14	720.48	751.62	770.69	796.77	796.77	796.77	796.77	796.77	796.77	796.77	796.77	796.77	796.77	796.77	
BENEFIT/COST	C	G2	A	D	THRIE	E	G4S	B	G4W	G3	G3	G3	G3	G3	G3	G3	G3	G3	G3	G3	
VALUES	.58	.56	.55	.44	.39	.38	.37	.37	.34	.20	.20	.20	.20	.20	.20	.20	.20	.20	.20	.20	

2 STATE COST		G1		G2		A		C		B		D		G4W		G4S		THRIE		G3	
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	618.48	
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	G2	E	G2	E	G2	E	G2	E	G2	E	G2	E	G2	
VALUES	74.70	84.28	87.13	91.99	122.21	123.64	124.43	131.37	143.01	143.22	143.22	143.22	143.22	143.22	143.22	143.22	143.22	143.22	143.22	143.22	
TOTAL COST	G2	A	C	G1	D	E	B	G4S	E	G2	E	G2	E	G2	E	G2	E	G2	E	G2	
VALUES	527.11	540.68	552.75	651.00	685.46	709.84	711.49	742.91	761.70	793.17	793.17	793.17	793.17	793.17	793.17	793.17	793.17	793.17	793.17	793.17	
BENEFIT/COST	C	G2	A	D	THRIE	E	G4S	B	G4W	G3	G3	G3	G3	G3	G3	G3	G3	G3	G3	G3	
VALUES	.59	.59	.57	.45	.40	.38	.38	.38	.35	.21	.21	.21	.21	.21	.21	.21	.21	.21	.21	.21	

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 3-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 5 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 360.55

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

0 STATE COST G1 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48

VALUES THRIE C G2 71.22 79.64 82.16 87.69 113.46 113.89 115.82 123.06 134.33 134.54 372.44

SOCIETAL COST THRIE C G2 71.22 79.64 82.16 87.69 113.46 113.89 115.82 123.06 134.33 134.54 372.44

VALUES G2 A C G1 517.37 531.94 548.11 650.91 681.17 701.53 702.81 734.30 753.01 789.64 1400.63

TOTAL COST G2 A C G1 517.37 531.94 548.11 650.91 681.17 701.53 702.81 734.30 753.01 789.64 1400.63

VALUES G2 A C G1 517.37 531.94 548.11 650.91 681.17 701.53 702.81 734.30 753.01 789.64 1400.63

BENEFIT/COST G2 A C G1 517.37 531.94 548.11 650.91 681.17 701.53 702.81 734.30 753.01 789.64 1400.63

VALUES G2 A C G1 517.37 531.94 548.11 650.91 681.17 701.53 702.81 734.30 753.01 789.64 1400.63

-2 STATE COST G1 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48

VALUES THRIE C G2 71.22 79.64 82.16 87.69 113.46 113.89 115.82 123.06 134.33 134.54 372.44

SOCIETAL COST THRIE C G2 71.22 79.64 82.16 87.69 113.46 113.89 115.82 123.06 134.33 134.54 372.44

VALUES G2 A C G1 517.37 531.94 548.11 650.91 681.17 701.53 702.81 734.30 753.01 789.64 1400.63

TOTAL COST G2 A C G1 517.37 531.94 548.11 650.91 681.17 701.53 702.81 734.30 753.01 789.64 1400.63

VALUES G2 A C G1 517.37 531.94 548.11 650.91 681.17 701.53 702.81 734.30 753.01 789.64 1400.63

BENEFIT/COST G2 A C G1 517.37 531.94 548.11 650.91 681.17 701.53 702.81 734.30 753.01 789.64 1400.63

VALUES G2 A C G1 517.37 531.94 548.11 650.91 681.17 701.53 702.81 734.30 753.01 789.64 1400.63

-4 STATE COST G1 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48

VALUES THRIE C G2 71.22 79.64 82.16 87.69 113.46 113.89 115.82 123.06 134.33 134.54 372.44

SOCIETAL COST THRIE C G2 71.22 79.64 82.16 87.69 113.46 113.89 115.82 123.06 134.33 134.54 372.44

VALUES G2 A C G1 517.37 531.94 548.11 650.91 681.17 701.53 702.81 734.30 753.01 789.64 1400.63

TOTAL COST G2 A C G1 517.37 531.94 548.11 650.91 681.17 701.53 702.81 734.30 753.01 789.64 1400.63

VALUES G2 A C G1 517.37 531.94 548.11 650.91 681.17 701.53 702.81 734.30 753.01 789.64 1400.63

BENEFIT/COST G2 A C G1 517.37 531.94 548.11 650.91 681.17 701.53 702.81 734.30 753.01 789.64 1400.63

VALUES G2 A C G1 517.37 531.94 548.11 650.91 681.17 701.53 702.81 734.30 753.01 789.64 1400.63

-6 STATE COST G1 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48

VALUES THRIE C G2 71.22 79.64 82.16 87.69 113.46 113.89 115.82 123.06 134.33 134.54 372.44

SOCIETAL COST THRIE C G2 71.22 79.64 82.16 87.69 113.46 113.89 115.82 123.06 134.33 134.54 372.44

VALUES G2 A C G1 517.37 531.94 548.11 650.91 681.17 701.53 702.81 734.30 753.01 789.64 1400.63

TOTAL COST G2 A C G1 517.37 531.94 548.11 650.91 681.17 701.53 702.81 734.30 753.01 789.64 1400.63

VALUES G2 A C G1 517.37 531.94 548.11 650.91 681.17 701.53 702.81 734.30 753.01 789.64 1400.63

BENEFIT/COST G2 A C G1 517.37 531.94 548.11 650.91 681.17 701.53 702.81 734.30 753.01 789.64 1400.63

VALUES G2 A C G1 517.37 531.94 548.11 650.91 681.17 701.53 702.81 734.30 753.01 789.64 1400.63

-8 STATE COST G1 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48

VALUES THRIE C G2 71.22 79.64 82.16 87.69 113.46 113.89 115.82 123.06 134.33 134.54 372.44

SOCIETAL COST THRIE C G2 71.22 79.64 82.16 87.69 113.46 113.89 115.82 123.06 134.33 134.54 372.44

VALUES G2 A C G1 517.37 531.94 548.11 650.91 681.17 701.53 702.81 734.30 753.01 789.64 1400.63

TOTAL COST G2 A C G1 517.37 531.94 548.11 650.91 681.17 701.53 702.81 734.30 753.01 789.64 1400.63

VALUES G2 A C G1 517.37 531.94 548.11 650.91 681.17 701.53 702.81 734.30 753.01 789.64 1400.63

BENEFIT/COST G2 A C G1 517.37 531.94 548.11 650.91 681.17 701.53 702.81 734.30 753.01 789.64 1400.63

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4R-3-2

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 3-FT SHOULDER

4R-3-4

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 7 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 313.28
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	D	C	E	G3	B	G4W	G1
VALUES	69.20	80.18	80.49	83.30	85.51	86.12	89.55	93.59	106.20	106.43	272.09
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	472.68	501.77	550.56	554.60	668.02	674.68	678.98	698.97	724.90	798.65	1412.07
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
VALUES	.60	.55	.48	.39	.38	.38	.36	.33	.32	.17	.15
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	C	D	E	G3	B	G4W	G1
VALUES	65.33	76.85	77.83	80.10	82.78	83.37	87.82	89.87	102.96	103.18	270.00
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	468.81	498.58	548.47	551.25	666.29	671.43	676.84	696.30	721.65	795.32	1408.34
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
VALUES	.61	.56	.49	.39	.39	.38	.37	.34	.33	.17	.16
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	C	D	E	G3	B	G4W	G1
VALUES	61.42	73.36	74.95	76.75	79.28	81.02	85.42	85.44	99.53	99.75	267.80
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	464.89	495.22	546.28	547.76	664.39	668.01	674.49	693.42	718.22	791.83	1404.42
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
VALUES	.62	.57	.50	.39	.39	.39	.38	.35	.33	.17	.16
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	C	D	E	G3	B	G4W	G1
VALUES	57.63	69.79	71.87	73.30	75.70	78.45	81.89	83.83	95.98	96.19	265.50
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	461.10	491.77	543.97	544.18	662.31	664.45	671.93	690.34	714.66	788.26	1400.37
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
VALUES	.63	.57	.51	.40	.40	.39	.38	.35	.34	.18	.17
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	C	D	E	G3	B	G4W	G1
VALUES	54.17	66.23	68.61	69.86	72.15	75.65	77.80	81.53	92.36	92.57	263.08
TOTAL COST	G2	A	C	G1	E	B	D	G4S	G4W	THRIE	G3
VALUES	457.65	488.33	540.62	541.56	660.01	660.84	669.13	687.09	711.05	784.70	1396.28
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1	G3
VALUES	.64	.58	.51	.40	.40	.40	.39	.36	.34	.18	.18

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SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 3-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 7 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 313.28

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	C	D	G3	E	B	G4W	G1
VALUES	51.25	62.78	65.20	66.53	68.70	72.62	73.79	79.00	88.78	88.98	260.56
TOTAL COST	G2	A	C	G1	B	E	D	G4S	G4W	THRIE	G3
VALUES	454.72	485.00	537.18	539.04	657.25	657.48	666.09	683.68	707.46	781.26	1392.26
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G1	G3
VALUES	.65	.54	.52	.41	.40	.40	.39	.36	.35	.19	.18

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	C	D	G3	E	B	G4W	G1
VALUES	48.97	59.52	61.67	63.37	65.45	69.37	69.92	76.23	85.27	85.47	257.96
TOTAL COST	G2	A	C	G1	B	E	D	G4S	G4W	THRIE	G3
VALUES	452.45	481.85	533.93	536.44	653.75	654.71	662.84	680.15	703.95	777.99	1388.39
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G1	G3
VALUES	.66	.60	.53	.41	.41	.41	.40	.37	.35	.20	.18

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-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	C	D	G3	E	B	G4W	G1
VALUES	47.29	56.45	58.06	60.40	62.39	65.94	66.21	73.25	81.86	82.06	255.31
TOTAL COST	G2	A	C	G1	B	E	D	G4S	G4W	THRIE	G3
VALUES	450.76	478.88	530.86	533.79	650.34	651.73	659.42	676.54	700.54	774.93	1384.68
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G1	G3
VALUES	.66	.60	.54	.42	.41	.41	.41	.37	.36	.21	.19

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	C	D	G3	E	B	G4W	G1
VALUES	45.93	53.54	54.45	57.58	59.46	62.45	62.63	70.13	78.53	78.73	252.68
TOTAL COST	G2	A	C	G1	B	E	D	G4S	G4W	THRIE	G3
VALUES	449.40	476.06	527.44	531.16	647.01	648.61	655.93	672.92	697.20	772.02	1381.11
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G1	G3
VALUES	.66	.61	.54	.42	.42	.42	.41	.38	.36	.22	.19

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	C	D	G3	E	B	G4W	G1
VALUES	44.56	50.80	51.00	54.91	56.66	59.13	59.21	67.07	75.31	75.51	250.16
TOTAL COST	G2	A	C	G1	B	E	D	G4S	G4W	THRIE	G3
VALUES	448.04	473.39	525.14	528.64	643.79	645.55	652.60	669.48	693.98	769.28	1377.69
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G1	G3
VALUES	.67	.62	.55	.43	.43	.42	.42	.38	.37	.23	.19

4R-3-4

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 3-FT SHOULDER

4R-3-6

PAVEMENT-10-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 9 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 272.47

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

10	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	D	E	C	A	G3	R		G4W	G1
VALUES	46.26	76.04	78.08	81.05	81.30	83.31	85.42	93.90	98.25	98.47	186.27	186.27
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3	
VALUES	449.74	484.74	504.40	551.78	659.77	666.72	674.53	694.51	716.95	796.56	1412.37	
BENEFIT/COST	G2	A	C	E	D	G4S	G1	B	G4W	THRIE	G3	
VALUES	.56	.45	.40	.33	.32	.32	.31	.28		.27	.14	

8	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	D	E	C	A	G3	B		G4W	G1
VALUES	45.29	73.62	74.51	79.16	79.67	79.42	82.77	90.11	95.19	95.41	181.10	
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3	
VALUES	448.77	459.57	501.24	548.39	658.14	663.67	672.64	692.10	713.89	792.99	1408.58	
BENEFIT/COST	G2	A	C	E	G1	D	G4S	B	G4W	THRIE	G3	
VALUES	.56	.45	.41	.33	.33	.32	.32	.31	.29	.28	.14	

6	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	C	D	E	A	G3	B		G4W	G1
VALUES	44.22	70.85	71.01	76.43	77.08	77.86	79.40	86.12	92.03	92.25	175.47	
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3	
VALUES	447.69	453.95	497.88	544.90	656.33	660.51	670.55	689.49	710.72	789.33	1404.54	
BENEFIT/COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3	
VALUES	.57	.46	.42	.35	.34	.33	.33	.32	.29	.28	.14	

4	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	C	D	E	A	G3	B		G4W	G1
VALUES	43.02	67.20	68.22	72.93	74.79	75.85	75.88	82.01	98.85	89.06	169.42	
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3	
VALUES	446.49	447.89	494.36	541.40	654.32	657.33	668.27	686.70	707.54	785.67	1400.48	
BENEFIT/COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3	
VALUES	.57	.47	.43	.37	.34	.33	.33	.32	.30	.29	.14	

2	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	C	A	D	E	G3	B		G4W	G1
VALUES	41.68	63.68	65.26	69.54	72.28	72.29	73.61	77.87	85.75	85.96	162.98	
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3	
VALUES	441.45	445.16	490.76	538.01	652.08	654.22	665.77	683.74	704.43	782.16	1396.35	
BENEFIT/COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3	
VALUES	.57	.48	.43	.39	.34	.34	.34	.33	.30	.29	.15	

A.120

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 3-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 9 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 272.47
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	C	A	D	E	G3	B	G4W	G1
VALUES	40.20	60.44	62.16	66.38	68.69	69.57	71.12	73.82	82.82	83.03	156.22
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	434.20	443.68	487.16	534.86	649.60	651.30	663.04	680.63	701.51	778.91	1392.30
BENEFIT/COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	.58	.49	.44	.44	.35	.34	.34	.33	.31	.30	.15
-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	C	A	D	E	G3	R	G4W	G1
VALUES	38.57	57.55	58.94	63.54	65.15	66.63	68.39	69.93	80.15	80.36	149.25
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	427.73	442.05	483.62	532.02	646.87	648.63	660.10	677.41	696.83	776.02	1388.41
BENEFIT/COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	.58	.50	.45	.44	.35	.35	.35	.34	.31	.30	.15
-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	C	A	D	E	G3	B	G4W	G1
VALUES	36.81	55.01	55.64	61.00	61.69	63.52	65.44	66.21	77.72	77.42	142.16
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	420.63	440.29	480.17	529.48	643.92	646.20	657.00	674.12	696.40	773.48	1384.69
BENEFIT/COST	G2	A	G1	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	.58	.50	.47	.45	.36	.35	.35	.34	.31	.30	.16
-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	C	D	E	G3	B	G4W	G1
VALUES	34.99	52.35	52.69	58.34	58.65	60.37	62.40	62.63	75.45	75.64	135.07
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	413.55	438.46	476.81	527.13	640.88	643.92	653.84	670.82	694.12	771.17	1381.11
BENEFIT/COST	G2	A	G1	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	.59	.51	.49	.46	.36	.36	.36	.35	.32	.31	.16
-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	C	D	E	G3	B	G4W	G1
VALUES	33.27	49.26	50.47	55.21	56.35	57.40	58.21	59.52	73.22	73.41	128.18
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	406.65	436.74	473.68	524.82	637.99	641.70	650.88	667.74	691.89	768.94	1377.69
BENEFIT/COST	G2	A	G1	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	.59	.52	.52	.46	.37	.36	.36	.35	.32	.31	.16

4R-3-6

4R-3-8

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 3-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 11 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 237.33

ADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	G1	E	THRIE	D	C	A	G3	B	G4W
VALUES	40.01	73.32	75.09	77.84	78.08	78.24	84.22	84.95	88.16	97.29	97.52
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	353.57	443.49	503.43	552.70	656.32	665.77	671.71	691.79	715.99	796.56	1406.64
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	.58	.49	.36	.33	.28	.27	.27	.25	.23	.22	.11
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	G1	THRIE	D	E	C	A	G3	B	G4W
VALUES	39.43	70.86	71.25	74.51	76.30	76.37	80.63	82.01	84.68	94.45	94.67
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	349.72	442.91	500.49	549.11	654.85	662.92	669.78	689.34	713.14	792.44	1403.15
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	.60	.49	.37	.33	.28	.27	.27	.25	.23	.23	.12
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	D	E	C	A	G3	B	G4W
VALUES	38.77	67.37	68.26	70.85	74.22	74.77	76.95	78.85	81.03	91.49	91.70
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	345.85	442.24	497.32	545.43	653.24	659.96	667.70	686.73	710.18	789.33	1399.50
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	.61	.49	.38	.34	.28	.27	.27	.26	.24	.23	.12
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	D	E	C	A	G3	B	G4W
VALUES	38.01	63.62	65.54	67.20	72.02	73.00	73.28	75.51	77.29	88.48	88.70
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	342.10	441.49	493.99	541.76	651.47	656.96	665.49	684.02	707.17	785.67	1395.76
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	.62	.49	.39	.35	.28	.28	.28	.26	.24	.24	.12
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	D	E	C	A	G3	B	G4W
VALUES	37.15	60.21	62.74	63.68	69.68	69.75	71.06	72.06	73.56	85.74	85.74
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	338.68	440.62	490.54	538.23	649.53	654.00	663.16	681.22	704.21	782.16	1392.03
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	.64	.50	.39	.36	.29	.28	.28	.27	.25	.24	.12

A.122

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 3-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 11 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 237.33
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	C	D	A	E	G3	B	G4W
VALUES	36.16	52.32	59.92	60.44	66.49	67.24	68.57	68.94	69.95	82.71	82.92
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	335.79	439.63	487.05	534.97	647.41	651.19	660.72	678.39	701.40	728.91	1388.42
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
VALUES	.65	.50	.40	.36	.29	.29	.29	.27	.25	.25	.13

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	C	D	A	E	G3	B	G4W
VALUES	35.04	55.08	57.09	57.55	63.58	64.72	65.11	66.53	66.64	80.11	80.31
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	333.55	438.52	483.58	532.06	645.11	648.59	658.19	675.57	698.79	726.02	1385.00
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
VALUES	.65	.50	.41	.37	.30	.29	.29	.28	.25	.25	.13

A.123

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	C	A	D	G3	E	B	G4W
VALUES	33.81	53.41	54.30	55.01	61.01	61.68	62.14	63.31	64.19	77.71	77.91
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	331.89	437.28	480.16	529.49	642.66	646.19	655.61	672.78	696.39	723.48	1381.78
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
VALUES	.66	.50	.42	.38	.30	.30	.30	.28	.26	.25	.13

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	C	D	G3	E	B	G4W
VALUES	32.53	51.56	52.07	52.69	58.34	58.65	59.55	60.25	61.67	75.45	75.64
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	330.54	436.00	476.81	527.13	640.15	643.92	653.03	670.04	694.12	721.17	1378.23
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
VALUES	.67	.51	.43	.38	.30	.30	.30	.28	.26	.26	.13

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	C	D	G3	E	B	G4W
VALUES	31.35	48.95	50.47	50.72	55.21	56.35	57.09	57.36	59.23	73.22	73.41
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	329.19	434.83	473.68	524.82	637.71	641.70	650.56	667.43	691.89	768.94	1375.84
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
VALUES	.67	.51	.44	.39	.31	.30	.30	.29	.27	.26	.14

4R-3-8

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 3-FT SHOULDER

4R-3-10

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 13 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 207.18

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE

1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	C	A	B	G4W
VALUES	37.05	54.64	72.35	77.25	77.84	78.08	84.22	84.95	88.16	97.29
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	333.11	440.52	503.43	552.70	656.32	655.77	670.73	690.82	796.56	1406.64
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	.55	.42	.29	.26	.22	.22	.22	.19	.18	.09

8 STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	D	E	C	A	B	G4W
VALUES	36.42	54.08	70.10	74.51	75.53	76.37	80.63	82.01	84.68	94.45
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	332.56	439.90	500.49	549.11	654.85	662.92	669.01	688.58	792.99	1403.15
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	.55	.42	.30	.27	.23	.22	.22	.20	.18	.09

A.124

6 STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	D	E	C	A	B	G4W
VALUES	35.77	53.44	67.70	70.85	73.66	74.77	76.95	78.85	81.03	91.70
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	331.92	439.24	497.32	545.43	653.24	659.96	667.14	686.18	790.18	1399.50
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G3
VALUES	.55	.42	.31	.28	.23	.23	.22	.20	.19	.10

4 STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	D	E	C	A	B	G4W
VALUES	35.09	52.69	65.17	67.20	71.64	73.00	73.28	75.51	77.29	88.70
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	331.16	438.57	493.99	541.76	651.47	656.96	665.11	683.64	785.67	1395.76
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G3
VALUES	.55	.43	.31	.29	.23	.23	.23	.21	.19	.10

2 STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	D	E	C	A	B	G4W
VALUES	34.40	51.79	62.52	63.68	69.46	69.75	71.06	72.06	73.56	85.74
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	330.27	437.88	490.54	538.23	649.53	654.00	662.93	681.00	782.16	1392.03
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G3
VALUES	.56	.43	.32	.29	.24	.23	.23	.21	.20	.10

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 3-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 13 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 207.18

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE

1	2	3	4	5	6	7	8	9	10	11
PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48
	SOCIETAL COST	G2	G1	G4S	THRIE	C	D	A	E	B
	VALUES	33.72	50.72	59.80	60.44	66.49	67.13	68.57	69.95	82.71
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE
	VALUES	329.20	437.19	487.05	534.97	647.41	651.19	660.61	678.28	701.40
	BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE
	VALUES	.56	.43	.33	.30	.24	.24	.24	.22	.20
-2	STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48
	SOCIETAL COST	G2	G1	G4S	THRIE	C	D	A	G3	E
	VALUES	33.03	49.45	57.05	57.55	63.58	64.68	65.11	66.53	66.64
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE
	VALUES	327.93	436.51	483.58	532.06	645.11	648.59	658.15	675.53	698.79
	BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE
	VALUES	.57	.43	.34	.31	.24	.24	.24	.22	.21
-4	STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48
	SOCIETAL COST	G2	G1	G4S	THRIE	C	D	A	G3	E
	VALUES	32.35	47.99	54.29	55.01	61.01	61.68	62.13	63.31	64.19
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE
	VALUES	326.46	435.82	480.16	529.49	642.66	646.19	655.60	672.77	696.39
	BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE
	VALUES	.57	.43	.35	.31	.25	.25	.24	.23	.21
-6	STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48
	SOCIETAL COST	G2	G1	G4S	THRIE	A	C	D	G3	E
	VALUES	31.67	46.41	51.56	52.69	58.34	58.65	59.55	60.25	61.67
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE
	VALUES	324.88	435.15	476.81	527.13	640.15	643.92	653.03	670.04	694.12
	BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE
	VALUES	.58	.43	.36	.32	.25	.25	.25	.23	.21
-8	STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48
	SOCIETAL COST	G2	G1	G4S	THRIE	A	C	D	G3	E
	VALUES	31.02	44.88	48.95	50.47	55.21	56.35	57.09	57.36	59.23
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE
	VALUES	323.36	434.49	473.68	524.82	637.71	641.70	650.56	667.43	691.89
	BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE
	VALUES	.58	.44	.36	.32	.26	.26	.25	.24	.22

A.125

4R-3-10

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 3-FT SHOULDER

4R-3-12

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 15 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 181.36

AAIT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	1318.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	C	A	G3	B	G4W	G4W
VALUES	37.05	49.17	72.35	77.25	77.84	78.08	84.22	84.95	85.30	85.30	97.29	97.52
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3	G3
VALUES	327.64	440.52	503.43	552.70	665.32	665.77	670.73	690.82	715.99	796.56	1403.77	1403.77
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3	G3
VALUES	.47	.36	.23	.21	.18	.18	.18	.15	.14	.14	.07	.07

8	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	1318.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	D	E	C	G3	A	B	G4W	G4W
VALUES	36.42	48.33	70.10	74.51	75.53	76.37	80.63	81.77	82.01	94.45	94.67	94.67
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3	G3
VALUES	326.80	439.90	500.49	549.11	654.85	662.92	669.01	688.58	713.14	792.99	1400.24	1400.24
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3	G3
VALUES	.48	.36	.24	.22	.18	.18	.18	.15	.15	.14	.08	.08

A.126

6	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	1318.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	D	E	C	G3	A	B	G4W	G4W
VALUES	35.77	47.39	67.70	70.85	73.66	74.77	76.95	78.12	78.85	91.49	91.70	91.70
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3	G3
VALUES	325.86	439.24	497.32	545.43	653.24	659.96	667.14	686.18	710.18	784.33	1396.60	1396.60
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3	G3
VALUES	.48	.36	.24	.22	.18	.18	.18	.16	.15	.14	.08	.08

4	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	1318.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	D	E	C	G3	A	B	G4W	G4W
VALUES	35.09	46.33	65.17	67.20	71.64	73.00	73.28	74.46	75.51	88.48	88.70	88.70
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3	G3
VALUES	324.81	438.57	493.99	541.76	651.47	656.96	665.11	683.64	707.17	785.67	1392.94	1392.94
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3	G3
VALUES	.48	.36	.25	.23	.19	.19	.18	.16	.16	.15	.08	.08

2	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	1318.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	D	E	C	G3	A	B	G4W	G4W
VALUES	34.40	45.14	62.52	63.68	69.46	69.75	70.91	71.06	72.06	85.53	85.74	85.74
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3	G3
VALUES	323.62	437.88	490.54	538.23	649.53	654.00	662.93	681.00	704.21	782.16	1389.38	1389.38
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3	G3
VALUES	.49	.36	.26	.24	.19	.19	.19	.17	.16	.15	.08	.08

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 3-FT SHOULDER

4R-3-12

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 15 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 181.36

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G1	G4S	THRIE	C	D	G3	A	E	B	G4W	
	VALUES	33.72	43.80	59.80	60.44	66.44	67.13	67.58	68.57	68.94	82.71	82.92
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	322.28	437.19	487.05	534.47	647.41	651.19	660.61	678.28	701.40	778.91	1386.06
	BENEFIT/COST	G1	G2	A	C	G4S	E	D	B	THRIE	G4W	G3
	VALUES	.49	.37	.27	.25	.20	.19	.14	.17	.12	.16	.09

-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	C	G3	D	A	E	B	G4W
	VALUES	33.03	42.31	57.05	57.55	63.58	64.58	64.68	65.11	66.64	80.11	80.31
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	320.79	436.51	483.58	532.06	645.11	648.59	658.15	675.53	698.79	776.02	1383.06
	BENEFIT/COST	G1	G2	A	C	G4S	E	D	B	THRIE	G4W	G3
	VALUES	.50	.37	.28	.25	.20	.20	.20	.18	.17	.16	.09

-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	C	G4S	A	D	E	B	G4W
	VALUES	32.35	40.68	54.29	55.01	61.01	61.68	61.90	62.13	64.19	77.71	77.91
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	319.16	435.82	480.16	529.49	642.66	646.19	655.60	672.77	696.39	773.48	1380.37
	BENEFIT/COST	G1	G2	A	C	G4S	E	D	B	THRIE	G4W	G3
	VALUES	.51	.37	.29	.26	.21	.20	.20	.18	.18	.17	.09

-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	A	C	G3	D	E	B	G4W
	VALUES	31.67	38.99	51.56	52.69	58.34	58.65	59.42	59.55	61.67	75.45	75.64
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	317.47	435.15	476.81	527.13	640.15	643.92	653.03	670.04	694.12	771.17	1377.90
	BENEFIT/COST	G1	G2	A	C	G4S	E	D	B	THRIE	G4W	G3
	VALUES	.51	.37	.29	.26	.21	.21	.21	.19	.18	.17	.09

-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	A	C	G3	D	E	B	G4W
	VALUES	31.02	37.42	48.95	50.47	55.21	56.35	57.04	57.09	59.23	73.22	73.41
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	315.90	434.49	473.68	524.82	637.71	641.70	650.56	667.43	691.89	768.94	1375.52
	BENEFIT/COST	G1	G2	A	C	G4S	E	D	B	THRIE	G4W	G3
	VALUES	.52	.37	.30	.27	.21	.21	.21	.19	.18	.17	.09

A.127

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 4 FT

4R-4-0

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 4 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 140.89

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	A	C	G3	B	G4W	G1	G1
VALUES	73.17	77.81	81.36	81.46	81.62	85.15	89.63	96.75	102.73	102.95	196.23
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	474.71	476.64	503.63	558.10	659.44	671.21	674.83	696.28	721.43	800.04	1415.23
BENEFIT/COST	G2	A	C	E	G4S	D	THRIE	B	G4W	G3	G1
VALUES	.17	.13	.11	.10	.10	.10	.08	.07	.06	.03	-.20

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	D	E	A	C	G3	B	G4W	G1
VALUES	69.35	75.67	78.32	79.72	80.02	82.28	86.53	93.34	99.96	100.17	192.19
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	470.67	472.83	500.75	555.00	658.50	668.43	673.20	694.15	718.65	796.79	1411.82
BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
VALUES	.18	.14	.12	.11	.11	.10	.09	.07	.07	.04	-.18

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	D	E	A	C	G3	B	G4W	G1
VALUES	65.27	73.30	74.78	77.89	78.43	79.11	83.15	89.60	96.93	97.15	187.68
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	466.15	468.75	497.59	551.63	656.90	665.41	671.36	691.77	715.62	793.25	1408.07
BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
VALUES	.19	.15	.12	.11	.11	.11	.09	.08	.07	.04	-.17

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	E	C	G3	B	G4W	G1
VALUES	61.02	70.67	71.07	75.69	75.83	76.64	79.54	85.55	93.68	93.89	182.66
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	461.13	464.49	494.16	548.01	655.11	662.16	669.31	689.15	712.37	789.54	1404.02
BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
VALUES	.20	.16	.13	.11	.11	.11	.10	.08	.08	.04	-.15

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	D	E	C	G3	B	G4W	G1
VALUES	56.75	67.29	67.80	72.08	73.53	74.61	75.75	81.26	90.26	90.47	177.13
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	455.60	460.23	490.55	544.23	653.09	658.74	667.00	686.27	708.94	785.76	1399.74
BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
VALUES	.21	.16	.14	.12	.11	.11	.10	.09	.08	.05	-.13

A.128

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 4 FT

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 4 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 140.84
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	D	C	E	G3	B	G4W	G1
VALUES	52.74	63.60	64.64	68.40	70.96	71.40	72.32	76.86	86.75	86.96	171.10
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	444.58	456.22	486.88	540.38	650.80	655.23	664.43	683.17	705.43	782.07	1345.33
BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
VALUES	.22	.17	.15	.12	.12	.12	.11	.10	.09	.05	-.11

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	D	C	E	G3	B	G4W	G1
VALUES	49.30	60.17	61.40	64.81	68.11	68.14	69.72	72.49	83.28	83.48	164.63
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	443.10	452.77	483.28	536.62	648.20	651.76	661.59	679.87	701.96	728.64	1390.96
BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
VALUES	.23	.18	.16	.13	.12	.12	.11	.10	.09	.05	-.09

A.129

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	D	C	E	G3	B	G4W	G1
VALUES	46.65	57.11	57.96	61.43	64.60	65.01	66.82	68.30	79.95	80.15	157.76
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	436.24	450.13	479.91	533.07	645.30	648.43	658.48	676.44	698.62	725.59	1386.78
BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
VALUES	.23	.19	.16	.13	.13	.13	.12	.11	.10	.06	-.05

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	D	C	E	G3	B	G4W	G1
VALUES	44.76	54.42	54.47	58.30	61.29	61.73	63.64	64.35	76.80	76.94	150.54
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	429.01	448.24	476.78	529.77	642.17	645.27	655.20	672.94	695.46	722.89	1382.82
BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
VALUES	.24	.20	.17	.14	.13	.13	.12	.11	.10	.06	-.03

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	C	E	G3	B	G4W	G1
VALUES	43.25	51.06	51.87	55.37	58.15	58.47	60.54	60.58	73.76	73.95	142.48
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	421.45	446.72	473.85	526.62	639.02	642.24	651.95	669.54	692.42	720.35	1374.06
BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
VALUES	.24	.20	.18	.15	.14	.14	.12	.12	.11	.06	-.01

4R-4-0

4R-4-2

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 4-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 6 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 336.05

ADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	D	G3	A	G4S	E	G2	B	G4W	G1
VALUES	42.07	114.77	117.62	118.61	166.16	168.28	171.80	181.44	188.31	188.53	347.85
TOTAL COST	C	A	G2	G1	D	E	B	G4S	G4W	THRIE	G3
VALUES	583.24	584.64	584.97	626.32	711.10	750.28	756.79	786.76	807.00	810.54	1437.08
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.47	.41	.38	.37	.34	.28	.27	.26	.24	.16	-.04

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	G2	B	G4W	G1
VALUES	88.89	109.19	112.82	112.82	159.31	161.56	165.63	172.98	181.03	181.25	347.84
TOTAL COST	G2	C	A	G1	D	E	B	G4S	G4W	THRIE	G3
VALUES	576.46	577.67	577.79	626.31	706.30	744.10	749.51	780.03	799.72	807.36	1431.29
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.48	.42	.40	.38	.34	.29	.28	.27	.25	.17	-.04

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	G2	B	G4W	G1
VALUES	85.45	103.23	105.59	107.66	151.74	154.15	158.81	163.72	173.06	173.27	347.83
TOTAL COST	G2	A	C	G1	D	E	B	G4S	G4W	THRIE	G3
VALUES	567.20	570.22	571.70	626.31	701.14	737.29	741.53	772.63	791.74	803.93	1425.07
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.50	.44	.43	.38	.35	.31	.29	.29	.26	.17	-.04

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	G2	B	G4W	G1
VALUES	81.79	96.99	100.06	102.23	143.52	146.12	151.39	153.80	164.46	164.67	347.82
TOTAL COST	G2	A	C	G1	D	E	B	G4S	G4W	THRIE	G3
VALUES	557.28	562.00	565.47	626.30	695.71	729.86	732.93	764.59	783.14	800.26	1418.53
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.51	.46	.45	.39	.35	.32	.31	.30	.28	.18	-.04

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	G2	B	G4W	G1
VALUES	77.96	90.71	93.45	96.71	134.80	137.58	143.41	143.44	155.42	155.62	347.81
TOTAL COST	G2	A	C	G1	D	E	B	G4S	G4W	THRIE	G3
VALUES	546.88	553.27	559.19	626.28	690.19	721.92	723.89	756.05	774.10	796.43	1411.93
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.52	.48	.48	.40	.36	.33	.32	.32	.29	.18	-.04

A.130

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 4-FT SHOULDER

4R-4-2

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 6 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 336.05
 ADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1	2	3	4	5	6	7	8	9	10	11
0 STATE COST										
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	B	G4W	G1
VALUES	74.07	84.73	87.12	91.38	125.82	128.75	132.85	135.14	146.23	347.79
TOTAL COST	G2	A	C	D	E	B	G4S	G4W	THRIE	G3
VALUES	536.32	544.29	553.20	626.26	684.85	713.62	714.70	747.23	764.91	1405.60
BENEFIT/COST	C	G2	A	D	THRIE	E	B	G4W	G3	G1
VALUES	.54	.50	.50	.41	.36	.35	.34	.33	.31	-.04
-2 STATE COST										
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	B	G4W	G1
VALUES	70.27	79.45	81.50	86.55	116.90	119.93	122.51	126.70	137.25	347.76
TOTAL COST	G2	A	C	D	E	B	G4S	G4W	THRIE	G3
VALUES	525.99	535.37	547.93	626.24	680.03	705.18	705.73	738.40	755.92	1399.98
BENEFIT/COST	C	G2	A	D	THRIE	E	B	G4S	G3	G1
VALUES	.55	.53	.52	.42	.37	.36	.35	.35	.32	-.04
-4 STATE COST										
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	B	G4W	G1
VALUES	66.67	75.18	76.90	82.48	108.29	111.33	112.70	118.32	128.77	347.72
TOTAL COST	G2	A	C	D	E	B	G4S	G4W	THRIE	G3
VALUES	516.18	526.77	543.66	626.20	675.95	696.80	697.24	729.90	747.44	1395.37
BENEFIT/COST	C	G2	A	D	THRIE	E	B	G4S	G3	G1
VALUES	.56	.55	.54	.43	.38	.37	.36	.36	.33	-.04
-6 STATE COST										
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	B	G4W	G1
VALUES	63.30	71.85	73.26	79.12	100.02	102.98	103.43	110.02	120.77	347.67
TOTAL COST	G2	A	C	D	E	B	G4S	G4W	THRIE	G3
VALUES	506.90	518.50	540.32	626.15	672.60	688.50	689.25	721.46	739.44	1391.74
BENEFIT/COST	G2	A	C	D	THRIE	E	B	G4S	G3	G1
VALUES	.58	.56	.56	.43	.39	.38	.38	.38	.35	-.04
-8 STATE COST										
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	B	G4W	G1
VALUES	60.03	68.88	70.04	76.08	91.79	94.31	94.66	101.66	112.86	347.61
TOTAL COST	G2	A	C	D	E	B	G4S	G4W	THRIE	G3
VALUES	497.78	510.27	537.36	626.08	669.56	680.13	681.34	713.13	731.53	1388.52
BENEFIT/COST	G2	A	C	D	E	B	G4S	THRIE	G3	G1
VALUES	.60	.58	.57	.44	.41	.39	.39	.38	.36	-.04

A.131

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 4-FT SHOULDER

4R-4-4

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 8 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 292.12

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	458.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	C	E	G3	B	G4W	G1
VALUES	73.17	82.25	83.54	85.15	85.80	89.63	89.65	96.75	107.92	108.13	265.60
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	476.64	503.63	544.07	558.10	668.12	676.39	679.27	700.73	726.61	802.01	1415.23
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
VALUES	.54	.49	.43	.35	.35	.34	.32	.30	.29	.15	.10

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	458.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	C	E	G3	B	G4W	G1
VALUES	69.35	79.88	80.48	82.28	83.93	86.53	88.02	93.34	104.93	105.14	263.57
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	472.83	500.75	542.05	555.00	666.50	673.40	677.40	698.35	723.62	798.96	1411.82
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
VALUES	.55	.50	.44	.35	.35	.34	.33	.30	.29	.15	.10

A.132

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	458.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	D	C	E	G3	B	G4W	G1
VALUES	65.27	77.14	77.25	79.11	81.84	83.15	86.24	89.60	101.66	101.87	261.42
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	468.75	497.59	539.90	551.63	664.76	670.14	675.32	695.72	720.35	795.62	1408.07
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
VALUES	.56	.51	.45	.36	.35	.35	.34	.31	.30	.15	.11

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	458.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	D	C	E	G3	B	G4W	G1
VALUES	61.02	73.54	74.35	75.69	79.52	79.54	84.39	85.55	98.13	98.34	259.14
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	464.49	494.16	537.62	558.01	662.87	664.61	673.00	692.83	716.82	792.02	1404.02
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
VALUES	.57	.52	.45	.36	.36	.35	.34	.31	.30	.16	.12

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	458.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	D	C	E	G3	B	G4W	G1
VALUES	56.75	69.76	71.19	72.08	75.75	76.93	81.26	82.29	94.39	94.59	256.71
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	460.23	490.55	535.19	544.23	660.77	662.86	670.41	689.67	713.07	788.23	1399.74
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
VALUES	.58	.53	.46	.36	.36	.36	.35	.32	.31	.16	.13

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 4-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 8 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 292,12
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
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0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	C	D	G3	E	B	G4W	G1
VALUES	52.74	65.91	67.80	68.40	71.90	74.07	76.86	79.44	90.51	90.71	254.12
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	456.22	486.88	532.60	570.38	658.42	658.49	667.54	686.27	709.19	784.38	1395.33
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G3	G1
VALUES	.59	.53	.47	.37	.37	.36	.35	.33	.31	.16	.14

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	C	D	G3	E	B	G4W	G1
VALUES	49.30	62.14	64.20	64.81	68.14	70.91	72.49	77.31	86.63	86.83	251.36
TOTAL COST	G2	A	G1	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	452.77	483.28	529.84	536.62	655.10	655.29	664.39	682.68	705.30	780.62	1390.96
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G3	G1
VALUES	.60	.54	.48	.37	.37	.37	.36	.33	.32	.17	.15

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	C	D	G3	E	B	G4W	G1
VALUES	46.65	58.60	60.46	61.43	64.60	67.50	68.30	74.39	82.84	83.03	248.44
TOTAL COST	G2	A	G1	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	450.13	479.91	526.92	533.07	651.31	652.86	660.97	678.94	701.51	772.07	1386.28
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G3	G1
VALUES	.61	.55	.49	.38	.38	.37	.37	.34	.33	.17	.16

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	C	D	G3	E	B	G4W	G1
VALUES	44.76	55.31	56.95	58.30	61.29	63.90	64.35	71.20	79.19	79.38	245.37
TOTAL COST	G2	A	G1	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	448.24	476.78	523.95	529.77	647.66	649.68	657.37	675.13	697.85	773.79	1382.82
BENEFIT/COST	G2	A	C	D	E	G4S	H	G4W	THRIE	G3	G1
VALUES	.61	.56	.49	.38	.38	.38	.37	.34	.33	.17	.17

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	C	D	G3	E	B	G4W	G1
VALUES	43.25	52.24	52.89	55.37	58.15	60.28	60.58	67.91	75.64	75.63	242.21
TOTAL COST	G2	A	G1	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	446.72	473.85	520.69	526.62	644.12	646.39	653.76	671.37	694.31	770.71	1379.06
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G1	G3
VALUES	.62	.57	.50	.39	.39	.39	.38	.35	.33	.18	.18

A.133

4R-4-4

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 4-FT SHOULDER

4R-4-6

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 10 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 254.24

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	C	A	G3	B	G4W	G1
VALUES	44.90	77.81	81.36	81.46	81.62	86.95	87.65	97.07	100.14	100.36	187.61
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	448.38	466.08	506.13	555.42	659.94	668.62	674.83	696.28	718.84	800.04	1415.54
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1	G3
VALUES	.52	.40	.36	.30	.29	.29	.27	.25	.24	.24	.12
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	D	E	C	A	G3	B	G4W	G1
VALUES	44.02	75.67	78.32	79.72	80.02	83.79	84.83	93.59	97.31	97.53	183.55
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	447.49	462.03	503.30	552.26	658.50	665.79	673.20	694.15	716.00	796.79	1412.07
BENEFIT/COST	G2	A	C	E	D	G4S	B	G1	G4W	THRIE	G3
VALUES	.52	.40	.36	.30	.29	.29	.28	.25	.25	.24	.12
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	D	E	C	A	G3	B	G4W	G1
VALUES	43.04	73.30	74.78	77.89	78.43	80.40	81.67	89.74	94.28	94.44	179.01
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	446.51	457.48	500.15	548.88	656.90	662.75	671.36	691.77	712.46	793.25	1408.26
BENEFIT/COST	G2	A	C	E	D	G4S	B	G1	G4W	THRIE	G3
VALUES	.52	.41	.37	.30	.30	.29	.28	.27	.26	.25	.12
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	D	E	C	A	G3	B	G4W	G1
VALUES	41.93	70.67	71.07	75.83	76.64	76.84	78.20	85.68	91.08	91.29	173.94
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	445.41	452.41	496.67	545.32	655.11	659.55	669.31	689.15	709.76	789.54	1404.15
BENEFIT/COST	G2	A	C	E	D	G4S	B	G1	G4W	THRIE	G3
VALUES	.53	.42	.38	.31	.30	.30	.29	.29	.26	.25	.13
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	C	D	A	E	G3	B	G4W	G1
VALUES	40.20	67.29	67.80	73.19	73.53	74.46	74.61	81.34	87.79	88.00	168.35
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	444.17	446.82	492.93	541.67	653.09	656.27	667.00	686.27	706.47	785.76	1399.81
BENEFIT/COST	G2	A	C	E	G1	D	G4S	B	G4W	THRIE	G3
VALUES	.53	.43	.39	.31	.31	.30	.30	.29	.27	.26	.13

A.134

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 4-FT SHOULDER

4R-4-6

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 10 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 254,24

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
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0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	C	A	D	E	G3	B	G4W	G1
VALUES	39.30	63.60	64.69	69.60	70.55	70.96	72.32	76.90	84.53	84.73	162.25
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	440.73	442.78	489.02	538.07	650.80	653.01	664.43	683.17	703.21	782.07	1395.37
BENEFIT/COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	.53	.44	.39	.33	.31	.31	.31	.30	.27	.27	.13

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	C	A	D	E	G3	B	G4W	G1
VALUES	37.74	60.17	61.40	66.22	66.60	68.11	69.72	72.51	81.43	81.63	155.71
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	434.18	441.22	485.07	534.70	648.20	649.90	661.59	679.87	700.10	778.64	1390.98
BENEFIT/COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	.54	.45	.40	.35	.32	.31	.31	.30	.28	.27	.14

A.135

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	C	D	E	G3	B	G4W	G1
VALUES	36.03	57.11	57.96	62.75	63.17	65.01	66.82	68.31	78.58	78.78	148.77
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	427.25	439.50	481.23	531.65	645.30	647.06	658.48	676.44	697.25	775.59	1386.78
BENEFIT/COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	.54	.46	.41	.38	.32	.32	.32	.31	.28	.27	.14

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	C	D	E	G3	B	G4W	G1
VALUES	34.21	54.42	54.47	59.10	60.43	61.73	63.69	64.35	75.97	76.16	141.48
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	419.96	437.68	477.58	528.91	642.17	644.45	655.20	672.94	694.64	772.89	1382.82
BENEFIT/COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	.55	.47	.41	.40	.33	.32	.32	.31	.29	.28	.14

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	C	D	E	G3	B	G4W	G1
VALUES	32.43	51.06	51.87	55.70	57.80	58.47	60.54	60.58	73.42	73.61	133.88
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	412.36	435.90	474.17	526.28	639.02	641.90	651.95	669.54	692.09	770.35	1379.06
BENEFIT/COST	G2	A	G1	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	.55	.47	.43	.42	.33	.33	.33	.32	.29	.28	.15

4R-4-8

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 4-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 221.67
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

10	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	D	G1	THRIE	A	C	G3	B	G4W	G4W
VALUES	38.68	75.22	78.09	78.68	78.68	81.62	86.64	87.90	91.38	99.15	99.15	99.37
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3	G3
VALUES	357.16	442.16	505.12	556.38	656.56	667.63	672.15	693.64	717.85	800.09	1409.85	
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G3
VALUES	.51	.45	.32	.29	.25	.24	.24	.22	.20	.19	.10	.10

8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	D	G1	THRIE	A	C	G3	B	G4W	G4W
VALUES	38.16	73.02	74.86	76.80	76.98	78.32	84.03	84.54	88.19	96.53	96.53	96.74
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3	G3
VALUES	353.34	441.64	502.51	553.02	655.27	665.00	670.46	691.50	715.22	796.79	1406.67	
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G3
VALUES	.53	.45	.33	.29	.25	.24	.24	.22	.20	.20	.10	.10

6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	D	G1	THRIE	A	C	G3	B	G4W	G4W
VALUES	37.58	70.64	70.78	74.78	75.14	75.34	80.96	81.08	84.70	93.91	93.91	93.91
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3	G3
VALUES	349.25	441.05	499.56	549.44	653.86	662.17	668.61	689.11	712.38	793.25	1403.18	
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G3
VALUES	.54	.46	.34	.30	.25	.25	.24	.23	.21	.20	.10	.10

4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	D	G1	THRIE	A	C	G3	B	G4W	G4W
VALUES	36.90	66.52	68.07	71.07	73.13	73.83	77.22	77.29	80.94	90.68	90.68	90.89
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3	G3
VALUES	345.00	440.38	496.27	545.70	652.30	659.16	666.61	686.54	709.36	789.54	1399.42	
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G3
VALUES	.56	.46	.34	.31	.26	.25	.25	.23	.21	.21	.11	.11

2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	D	G1	THRIE	A	C	G3	B	G4W	G4W
VALUES	36.11	62.27	65.33	67.29	70.97	72.08	73.43	74.21	76.99	87.55	87.55	87.75
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3	G3
VALUES	340.74	439.59	492.69	541.90	650.56	656.02	669.45	683.81	706.23	785.76	1395.46	
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G3
VALUES	.57	.46	.35	.32	.26	.25	.25	.24	.22	.21	.11	.11

A.136

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 4-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 221.67

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE

1	2	3	4	5	6	7	8	9	10	11
PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
0	STATE COST	G1	G2	A	C	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	618.48	718.48	1318.48
	SOCIETAL COST	G1	G2	G4S	THRIE	D	C	A	B	G4W
	VALUES	35.19	58.27	62.47	63.60	68.65	69.72	70.13	72.96	84.61
	TOTAL COST	G1	G2	A	C	E	D	G4S	THRIE	G3
	VALUES	336.74	438.67	480.89	538.20	648.61	652.88	680.95	782.07	1391.44
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	G3
	VALUES	.59	.46	.36	.32	.26	.26	.24	.22	.11
-2	STATE COST	G1	G2	A	C	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	618.48	718.48	1318.48
	SOCIETAL COST	G1	G2	G4S	THRIE	D	C	A	B	G4W
	VALUES	34.13	54.83	59.54	60.17	66.19	66.27	67.95	69.03	81.58
	TOTAL COST	G1	G2	A	C	E	D	G4S	THRIE	G3
	VALUES	333.31	437.61	485.02	534.74	646.42	649.85	678.02	778.64	1387.50
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	G3
	VALUES	.60	.46	.37	.33	.27	.26	.25	.22	.12
-4	STATE COST	G1	G2	A	C	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	618.48	718.48	1318.48
	SOCIETAL COST	G1	G2	G4S	THRIE	A	C	D	B	G4W
	VALUES	32.93	52.19	56.59	57.11	62.74	63.19	65.32	65.53	78.26
	TOTAL COST	G1	G2	A	C	E	D	G4S	THRIE	G3
	VALUES	330.67	436.41	481.22	531.66	644.01	647.04	675.06	775.59	1383.79
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	G3
	VALUES	.61	.47	.38	.34	.27	.27	.25	.23	.12
-6	STATE COST	G1	G2	A	C	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	618.48	718.48	1318.48
	SOCIETAL COST	G1	G2	G4S	THRIE	A	C	D	B	G4W
	VALUES	31.65	50.31	53.64	54.42	59.10	60.44	61.87	62.92	75.97
	TOTAL COST	G1	G2	A	C	E	D	G4S	THRIE	G3
	VALUES	328.79	435.12	477.57	528.91	641.40	644.44	672.12	772.89	1380.35
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	G3
	VALUES	.62	.47	.39	.34	.27	.27	.26	.24	.12
-8	STATE COST	G1	G2	A	C	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	618.48	718.48	1318.48
	SOCIETAL COST	G1	G2	G4S	THRIE	A	C	D	B	G4W
	VALUES	30.41	48.81	50.72	51.87	55.20	57.80	58.13	60.23	73.61
	TOTAL COST	G1	G2	A	C	E	D	G4S	THRIE	G3
	VALUES	327.29	433.89	474.17	526.28	638.70	641.90	669.20	770.35	1377.11
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	G3
	VALUES	.62	.47	.40	.35	.28	.28	.26	.24	.12

A.137

4R-4-8

4R-4-10

4-LANE RURAL ROAD WITH 4-FT SHOULDER

SUMMARY OF RESULTS

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 193.76

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G2	G4S	D	E	THRIE	A	C	G3	B	G4W
VALUES	35.86	52.73	74.21	77.65	78.04	81.62	86.64	87.90	91.38	99.15	99.37
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	331.21	439.33	505.12	556.38	656.56	667.63	671.13	692.68	717.85	800.09	1409.85
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.51	.39	.26	.23	.20	.20	.19	.17	.16	.15	.08

8	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G2	G4S	D	E	THRIE	A	C	G3	B	G4W
VALUES	35.28	52.12	72.23	76.17	76.80	78.32	84.03	84.54	88.19	96.53	96.74
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	330.59	438.76	502.51	553.02	655.27	665.00	669.65	690.70	715.22	796.79	1408.67
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.51	.39	.26	.23	.20	.20	.20	.17	.16	.16	.08

6	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G2	G4S	D	THRIE	E	C	A	G3	B	G4W
VALUES	34.68	51.47	70.05	74.53	74.78	75.34	80.96	81.08	84.70	93.70	93.91
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	329.94	438.16	499.56	549.44	653.86	662.17	668.01	688.52	712.38	793.25	1403.18
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.51	.39	.27	.24	.20	.20	.20	.18	.17	.16	.08

4	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G2	G4S	THRIE	D	THRIE	E	C	A	B	G4W
VALUES	34.06	50.74	67.66	71.07	72.72	73.83	77.22	77.79	80.94	90.68	90.89
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	329.21	437.54	496.27	545.70	652.30	659.16	666.20	686.14	709.36	789.54	1399.42
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.51	.40	.28	.25	.21	.20	.20	.18	.17	.17	.09

2	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G2	G4S	THRIE	D	THRIE	E	C	A	B	G4W
VALUES	33.42	49.89	65.08	67.29	70.72	72.08	73.43	74.21	76.99	87.55	87.75
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	328.36	436.90	492.69	541.90	650.56	656.02	664.20	683.56	706.23	785.76	1395.46
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.52	.40	.29	.26	.21	.21	.21	.19	.18	.17	.09

A.138

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 4-FT SHOULDER

4R-4-10

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 133.76

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G1	G2	G4S	THRIE	D	C	E	A	G3	B	G4W
	VALUES	32.77	48.88	62.34	63.60	68.52	69.72	70.13	70.42	72.96	84.40	84.61
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	327.36	436.25	488.89	538.20	648.61	652.88	662.00	680.82	703.08	782.07	1391.44
	BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
	VALUES	.52	.40	.29	.26	.21	.21	.22	.19	.18	.18	.09

-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G1	G2	G4S	THRIE	D	C	E	A	G3	B	G4W
	VALUES	32.11	47.68	59.49	60.17	66.14	66.27	66.55	67.95	69.03	81.38	81.58
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	326.16	435.59	485.02	534.74	646.42	649.85	659.61	677.47	700.05	778.64	1387.50
	BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
	VALUES	.52	.40	.30	.27	.22	.22	.22	.20	.19	.18	.09

A.139

-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G1	G2	G4S	THRIE	A	C	D	G3	E	B	G4W
	VALUES	31.44	46.27	56.57	57.11	62.74	63.19	63.57	65.32	65.53	78.57	78.76
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	324.75	434.91	481.22	531.66	644.01	647.04	657.05	675.05	697.24	775.59	1383.79
	BENEFIT/COST	G1	G2	A	C	G4S	E	D	B	THRIE	G4W	G3
	VALUES	.53	.40	.31	.28	.22	.22	.22	.20	.19	.19	.10

-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G1	G2	G4S	THRIE	A	C	D	G3	E	B	G4W
	VALUES	30.75	44.71	53.64	54.42	59.10	60.44	60.87	61.87	62.92	75.97	76.16
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	323.18	434.22	477.57	528.91	641.40	644.44	654.35	672.11	694.63	772.89	1380.35
	BENEFIT/COST	G1	G2	A	C	G4S	E	D	B	THRIE	G4W	G3
	VALUES	.54	.40	.32	.28	.23	.23	.22	.21	.19	.19	.10

-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G1	G2	G4S	THRIE	A	C	D	G3	E	B	G4W
	VALUES	30.04	43.15	50.72	51.87	55.70	57.80	58.13	58.63	60.23	73.42	73.61
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	321.63	433.52	474.17	526.28	638.70	641.90	651.60	669.20	692.09	770.35	1377.11
	BENEFIT/COST	G1	G2	A	C	G4S	E	D	B	THRIE	G4W	G3
	VALUES	.54	.41	.33	.29	.23	.23	.23	.21	.20	.19	.10

4R-4-12

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 4-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 169.90

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10	STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	B	G4W
	VALUES	35.86	47.39	74.21	77.65	78.09	81.62	86.64	87.90	88.65	99.15
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	325.87	439.33	505.12	556.38	656.56	667.63	671.13	692.68	717.85	800.09
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
	VALUES	.44	.33	.20	.18	.16	.16	.15	.12	.11	.06

8	STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	B	G4W
	VALUES	35.28	46.61	72.23	76.17	76.80	78.32	84.03	84.54	85.40	96.53
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	325.09	438.76	502.51	553.02	655.27	665.00	669.65	690.70	715.22	796.79
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
	VALUES	.44	.33	.21	.18	.16	.16	.16	.13	.12	.06

6	STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	B	G4W
	VALUES	34.68	45.74	70.05	74.53	74.78	75.39	80.96	81.08	81.90	93.91
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	324.21	438.16	499.56	549.44	653.86	662.17	668.01	688.52	712.38	793.25
	BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G3
	VALUES	.45	.34	.21	.19	.16	.16	.16	.13	.12	.07

4	STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	D	E	A	G3	B	G4W
	VALUES	34.06	44.75	67.66	71.07	72.72	73.83	77.79	78.19	80.68	90.84
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	323.23	437.54	496.27	545.70	652.30	659.16	666.20	686.14	709.36	789.54
	BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G3
	VALUES	.45	.34	.22	.20	.17	.17	.16	.14	.13	.07

2	STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	D	E	A	G3	B	G4W
	VALUES	33.42	43.64	65.08	67.29	70.72	72.08	73.43	74.21	74.39	87.55
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	322.11	436.90	492.69	541.90	650.56	656.02	664.20	683.56	706.23	785.76
	BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G3
	VALUES	.45	.34	.23	.21	.17	.17	.17	.14	.13	.07

A.140

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 4-FT SHOULDER

4R-4-12

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 169.90

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1 2 3 4 5 6 7 8 9 10 11

0	STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	D	C	A	G3	B	G4W
	VALUES	32.77	42.37	62.34	63.60	68.52	69.72	70.13	70.42	84.40	84.61
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	320.85	436.25	488.89	538.20	648.61	652.88	662.00	680.82	782.07	1389.10
	BENEFIT/COST	G1	G2	A	C	G4S	E	D	THRIE	G4W	G3
	VALUES	.46	.34	.24	.21	.17	.17	.15	.15	.14	.08

-2	STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	D	C	A	G3	B	G4W
	VALUES	32.11	40.94	59.49	60.17	66.14	66.27	66.55	67.07	81.38	81.58
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	319.42	435.59	485.02	534.74	646.42	649.85	659.61	677.97	778.64	1385.55
	BENEFIT/COST	G1	G2	A	C	G4S	E	D	THRIE	G4W	G3
	VALUES	.46	.34	.25	.22	.18	.18	.17	.16	.15	.08

-4	STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	A	C	D	G3	E	G4W
	VALUES	31.44	39.35	56.57	57.11	62.74	63.19	63.57	63.87	78.57	78.76
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	317.83	434.91	481.22	531.66	644.01	647.04	657.05	675.05	775.59	1382.35
	BENEFIT/COST	G1	G2	A	C	G4S	E	D	THRIE	G4W	G3
	VALUES	.47	.34	.26	.23	.18	.18	.16	.16	.15	.08

-6	STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	A	C	D	G3	E	G4W
	VALUES	30.75	37.66	53.64	54.42	59.10	60.44	60.87	61.00	75.97	76.16
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	316.13	434.22	477.57	528.91	641.40	644.44	654.35	672.11	772.89	1379.48
	BENEFIT/COST	G1	G2	A	C	G4S	E	D	THRIE	G4W	G3
	VALUES	.47	.34	.26	.23	.19	.18	.17	.16	.15	.08

-8	STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	A	C	D	G3	E	G4W
	VALUES	30.04	36.02	50.72	51.87	55.70	57.80	58.13	58.28	73.42	73.61
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	314.50	433.52	474.17	526.28	638.70	641.90	651.60	669.20	770.35	1376.76
	BENEFIT/COST	G1	G2	A	C	G4S	E	D	THRIE	G4W	G3
	VALUES	.48	.35	.27	.24	.19	.19	.17	.16	.16	.08

A.141

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 5 FT

4R-5-0

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 5 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 131.31

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1	2	3	4	5	6	7	8	9	10	11

A.142

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 5 FT

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 5 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 131.31

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE

1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48 1318.48
SOCIETAL COST	G2	THRIE	G4S	A	D	E	C	G3	B	G4W G1
VALUES	54.68	66.10	66.29	69.54	71.42	72.58	74.38	79.20	87.77	87.96 172.38
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE G3
VALUES	450.86	458.15	488.02	542.85	651.06	656.24	664.89	684.76	706.44	784.58 1392.67
BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3 G1
VALUES	.14	.15	.12	.11	.10	.10	.09	.08	.07	.04 -.15

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48 1318.48
SOCIETAL COST	G2	THRIE	G4S	A	D	E	C	G3	B	G4W G1
VALUES	50.31	62.39	63.10	65.73	68.81	70.24	70.37	74.61	84.13	84.32 166.73
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE G3
VALUES	445.21	453.78	484.21	538.85	648.72	656.61	662.29	681.58	702.80	780.87 1393.08
BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3 G1
VALUES	.20	.16	.13	.11	.11	.11	.10	.08	.08	.04 -.13

A.143

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48 1318.48
SOCIETAL COST	G2	THRIE	G4S	A	D	E	C	G3	B	G4W G1
VALUES	46.60	58.95	59.71	62.03	65.90	66.47	67.58	70.08	80.55	80.74 160.58
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE G3
VALUES	439.06	450.07	480.51	534.95	646.06	649.03	659.38	678.19	699.21	777.43 1388.55
BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3 G1
VALUES	.21	.17	.14	.12	.11	.11	.10	.09	.08	.05 -.11

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48 1318.48
SOCIETAL COST	G2	THRIE	G4S	A	D	E	C	G3	B	G4W G1
VALUES	43.87	55.94	56.23	58.64	62.26	62.88	64.62	65.83	77.18	77.36 153.95
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE G3
VALUES	432.42	447.34	477.12	531.35	643.10	645.65	656.23	674.70	695.84	774.41 1388.30
BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3 G1
VALUES	.22	.17	.15	.12	.12	.12	.10	.10	.09	.05 -.08

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48 1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	E	C	G3	B	G4W G1
VALUES	42.00	52.80	53.25	55.60	59.53	59.59	61.53	61.92	74.04	74.22 146.79
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE G3
VALUES	425.26	445.47	474.08	528.07	640.01	642.51	653.01	671.27	692.69	771.72 1380.39
BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3 G1
VALUES	.22	.18	.15	.13	.12	.12	.11	.10	.09	.05 -.06

4R-5-0

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 5-FT SHOULDER

4R-5-2

PAVEMENT-10-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-10-OBSTACLE DISTANCE = 2 FT

PAVEMENT-10-OBSTACLE DISTANCE = 7 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 313.28

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	D	G3	A	G4S	E	B	G4W	G2	G1
VALUES	93.64	114.51	120.68	122.84	168.96	172.32	174.75	191.87	192.08	192.18	324.34
TOTAL COST	A	C	G2	G1	D	E	B	G4S	G4W	THRIE	G3
VALUES	587.43	587.98	595.65	602.86	714.15	753.22	760.35	790.80	810.56	812.17	1441.31
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1
VALUES	.41	.34	.32	.31	.30	.24	.23	.21	.20	.14	-.04

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	D	G3	A	G4S	E	B	G4W	G2	G1
VALUES	90.74	114.38	116.31	117.64	163.45	166.79	169.70	185.01	185.85	186.06	324.34
TOTAL COST	A	C	G2	G1	D	E	B	G4S	G4W	THRIE	G3
VALUES	581.93	582.86	588.48	602.87	709.78	748.18	754.33	785.27	804.54	809.22	1436.11
BENEFIT/COST	C	A	D	G2	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.42	.36	.33	.32	.31	.25	.24	.22	.21	.15	-.04

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	D	G3	A	G4S	E	B	G4W	G2	G1
VALUES	87.54	108.78	111.50	111.88	157.17	160.54	164.00	174.94	174.06	174.27	324.40
TOTAL COST	A	C	G2	G1	D	E	B	G4S	G4W	THRIE	G3
VALUES	575.64	577.25	580.46	602.88	704.98	742.48	747.54	774.02	797.74	806.02	1430.36
BENEFIT/COST	C	A	D	G2	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.44	.37	.34	.34	.31	.26	.25	.24	.22	.15	-.04

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	D	G3	A	G4S	E	B	G4W	G2	G1
VALUES	84.05	102.70	105.58	106.26	150.07	153.54	157.61	168.04	171.47	171.67	324.41
TOTAL COST	A	C	G2	G1	D	E	B	G4S	G4W	THRIE	G3
VALUES	568.55	571.17	571.56	602.84	694.73	736.04	739.95	772.01	790.15	802.53	1424.06
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.45	.39	.36	.35	.32	.27	.26	.25	.23	.16	-.04

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	D	G3	A	G4S	E	B	G4W	G2	G1
VALUES	80.24	96.23	98.84	100.64	142.20	145.74	150.52	163.36	163.13	163.33	324.42
TOTAL COST	A	G2	C	G1	D	E	B	G4S	G4W	THRIE	G3
VALUES	560.67	561.84	564.71	602.90	694.12	724.00	731.61	764.27	781.81	798.76	1417.31
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.46	.41	.38	.36	.32	.28	.27	.26	.24	.16	-.04

A.144

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 5-FT SHOULDER

4R-5-2

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 7 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 313.28

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	G2	B	G4W	G1
VALUES	76.31	89.62	91.90	94.84	133.70	137.43	142.82	148.01	154.23	154.42	324.43
TOTAL COST	G2	A	C	G1	D	E	B	G4S	G4W	THRIE	G3
VALUES	551.49	552.18	558.09	602.91	688.32	721.29	722.70	755.91	772.90	794.78	1410.37
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.48	.43	.41	.37	.33	.29	.28	.28	.26	.17	-.04

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	G2	B	G4W	G1
VALUES	72.24	83.27	85.20	89.20	124.88	128.72	134.69	137.40	145.10	145.30	324.44
TOTAL COST	G2	A	C	G1	D	E	B	G4S	G4W	THRIE	G3
VALUES	540.87	543.35	551.25	602.92	682.68	713.16	713.58	747.20	763.77	790.72	1403.68
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.49	.45	.44	.38	.34	.31	.30	.30	.27	.17	-.04

A.145

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	G2	B	G4W	G1
VALUES	68.30	77.74	79.32	84.15	116.12	120.01	126.41	127.01	136.22	136.41	324.44
TOTAL COST	G2	A	C	G1	D	E	B	G4S	G4W	THRIE	G3
VALUES	530.48	534.60	546.21	602.92	672.62	704.70	704.89	738.48	754.88	786.77	1397.79
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.50	.47	.46	.39	.34	.32	.31	.31	.29	.18	-.04

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	G2	B	G4W	G1
VALUES	64.63	73.39	74.65	80.00	107.75	111.57	117.22	118.21	127.91	128.09	324.44
TOTAL COST	G2	A	C	G1	D	E	B	G4S	G4W	THRIE	G3
VALUES	520.70	526.22	541.87	602.91	673.48	696.38	696.68	730.05	746.57	783.11	1393.12
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.51	.49	.49	.39	.35	.34	.33	.33	.30	.18	-.04

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	G2	B	G4W	G1
VALUES	61.24	70.01	70.98	76.61	99.60	103.31	107.85	109.99	119.46	120.15	324.42
TOTAL COST	G2	A	C	G1	D	E	B	G4S	G4W	THRIE	G3
VALUES	511.33	518.08	538.48	602.90	670.09	688.44	688.46	721.78	738.62	779.72	1389.46
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.52	.51	.51	.40	.35	.35	.34	.34	.31	.18	-.04

4R-5-4

SUMMARY OF RESULTS 4-LANE RURAL ROAD WITH 5-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 9 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 272.47

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	D	A	E	C	G3	B	G4W	G1
	VALUES	75.56	82.43	84.78	84.87	85.04	89.34	91.18	97.20	107.92	108.13	258.28
	TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	479.04	503.51	536.75	559.66	667.82	676.40	678.34	700.90	726.61	803.26	1416.17
	BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
	VALUES	.49	.45	.39	.32	.32	.31	.29	.27	.26	.13	.05

8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	A	D	E	C	G3	B	G4W	G1
	VALUES	71.98	80.39	82.17	82.60	83.27	87.62	88.41	94.77	105.25	105.46	256.47
	TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	475.46	501.07	534.95	556.89	666.10	673.73	676.75	698.87	723.94	800.65	1413.25
	BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
	VALUES	.50	.45	.39	.32	.32	.31	.29	.27	.26	.13	.06

A.146

6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	A	D	E	C	G3	B	G4W	G1
	VALUES	68.06	78.10	79.22	79.82	81.48	85.35	85.88	91.46	102.29	102.50	254.55
	TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	471.54	498.30	533.02	553.82	664.36	670.77	674.95	696.58	720.97	797.70	1409.93
	BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
	VALUES	.51	.46	.40	.32	.32	.31	.30	.27	.27	.14	.06

4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	A	D	E	C	G3	B	G4W	G1
	VALUES	63.81	75.52	75.52	76.70	79.45	81.97	84.07	87.74	99.02	99.22	252.48
	TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	467.28	495.18	530.96	550.45	662.55	667.49	672.92	694.00	717.70	794.39	1406.21
	BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
	VALUES	.52	.47	.41	.33	.33	.32	.31	.28	.27	.14	.07

2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	THRIE	G4S	A	D	E	C	G3	B	G4W	G1
	VALUES	59.29	72.27	72.53	73.25	77.16	78.29	82.13	83.63	95.43	95.63	250.26
	TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	462.76	491.72	528.74	556.77	660.60	663.90	670.63	691.11	714.10	790.75	1402.10
	BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G3	G1
	VALUES	.53	.48	.41	.33	.33	.32	.31	.29	.28	.14	.08

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 5-FT SHOULDER

4R-5-4

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 9 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 272.47

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE

1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
0	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	468.48	568.48	578.48	593.48	618.48	718.48
SOCIETAL COST	G2	THRIE	G4S	A	C	D	D	G3	E	G4W
VALUES	54.68	68.37	69.43	69.54	74.38	74.57	74.20	79.99	91.56	247.86
TOTAL COST	G2	A	G1	C	E	B	D	D	G4S	THRIE
VALUES	458.15	488.02	526.34	542.85	558.47	658.04	668.04	687.91	710.23	1347.67
BENEFIT/COST	G2	A	C	D	G4S	E	B	B	THRIE	G3
VALUES	.54	.48	.42	.33	.33	.33	.32	.29	.15	.09

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
-2	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	468.48	568.48	578.48	593.48	618.48	718.48
SOCIETAL COST	G2	THRIE	A	G4S	C	D	D	G3	E	G4W
VALUES	50.31	64.36	65.73	65.96	70.37	71.67	71.61	77.60	87.53	245.27
TOTAL COST	G2	A	G1	C	E	B	D	D	G4S	THRIE
VALUES	453.78	484.21	523.74	538.85	656.01	656.08	665.14	684.43	706.20	1393.08
BENEFIT/COST	G2	A	C	D	G4S	E	B	B	THRIE	G3
VALUES	.55	.49	.43	.34	.34	.33	.33	.29	.15	.10

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
-4	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	468.48	568.48	578.48	593.48	618.48	718.48
SOCIETAL COST	G2	THRIE	A	G4S	C	D	D	G3	E	G4W
VALUES	46.60	60.46	62.03	62.27	66.47	68.46	70.08	74.91	83.51	242.45
TOTAL COST	G2	A	G1	C	E	B	D	D	G4S	THRIE
VALUES	450.07	480.51	520.93	534.95	651.98	653.39	661.93	680.75	702.17	1388.55
BENEFIT/COST	G2	A	C	D	G4S	E	B	B	THRIE	G3
VALUES	.56	.50	.44	.34	.34	.34	.33	.30	.15	.11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
-6	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	468.48	568.48	578.48	593.48	618.48	718.48
SOCIETAL COST	G2	THRIE	A	G4S	C	D	D	G3	E	G4W
VALUES	43.87	56.88	58.48	58.64	62.88	65.00	65.83	71.91	79.65	239.40
TOTAL COST	G2	A	G1	C	E	B	D	D	G4S	THRIE
VALUES	447.34	477.12	517.87	531.35	648.13	650.39	658.47	676.46	698.31	1384.30
BENEFIT/COST	G2	A	C	D	G4S	E	B	B	THRIE	G3
VALUES	.57	.51	.45	.35	.35	.35	.34	.30	.16	.12

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
-8	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	468.48	568.48	578.48	593.48	618.48	718.48
SOCIETAL COST	G2	THRIE	A	G4S	C	D	D	G3	E	G4W
VALUES	42.00	53.64	54.71	55.60	59.59	61.42	61.92	68.71	76.01	236.11
TOTAL COST	G2	A	G1	C	E	B	D	D	G4S	THRIE
VALUES	445.47	474.08	514.59	528.07	644.49	647.19	654.90	673.19	694.67	1380.39
BENEFIT/COST	G2	A	C	D	G4S	E	B	B	THRIE	G3
VALUES	.57	.52	.45	.36	.35	.35	.35	.30	.16	.13

A.147

4R-5-6

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 5-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 11 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 237.33
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
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10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	C	G3	B	G4W	G1
VALUES	43.40	78.00	80.45	80.78	83.03	87.42	88.63	98.03	100.34	100.55	184.13
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	446.88	462.60	505.89	557.10	659.26	668.81	673.93	696.48	719.02	801.51	1416.50
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1	G3
VALUES	.48	.36	.32	.27	.26	.26	.24	.22	.21	.19	.11

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	C	G3	B	G4W	G1
VALUES	42.57	76.19	79.08	79.44	80.16	85.04	85.79	95.03	97.80	98.01	181.05
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	446.04	459.53	503.51	554.27	657.92	666.27	672.55	694.67	716.48	798.64	1413.51
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1	G3
VALUES	.48	.36	.32	.27	.27	.26	.25	.23	.22	.20	.11

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	C	G3	B	G4W	G1
VALUES	41.65	74.14	77.00	77.52	78.00	82.29	82.70	91.65	95.04	95.24	177.53
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	445.13	456.00	500.76	551.18	656.47	663.51	670.99	692.62	713.72	795.48	1410.13
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1	G3
VALUES	.48	.37	.33	.28	.27	.26	.25	.23	.22	.21	.11

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	C	G3	B	G4W	G1
VALUES	40.63	71.82	73.56	75.74	76.41	79.14	79.35	87.87	92.05	92.25	173.50
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	444.11	451.97	497.61	547.83	654.88	660.53	669.22	690.29	710.73	792.03	1406.35
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	G1	THRIE	G3
VALUES	.49	.38	.34	.28	.27	.27	.26	.23	.23	.23	.11

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	C	G3	B	G4W	G1
VALUES	39.49	69.20	69.89	73.72	74.62	75.58	75.79	83.71	88.87	89.07	168.92
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	442.96	447.40	494.05	544.27	653.10	657.35	667.20	687.68	707.54	788.36	1402.14
BENEFIT/COST	G2	A	C	E	D	G4S	B	G1	G4W	THRIE	G3
VALUES	.49	.39	.34	.28	.28	.27	.26	.25	.24	.23	.12

A.148

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 5-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 11 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 237,33

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	D	A	C	E	G3	B	G4W	G1
VALUES	38.19	66.10	66.29	71.42	71.66	72.10	72.58	74.24	85.57	85.76	163.78
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	441.67	442.26	490.14	540.58	651.06	654.04	664.89	684.76	704.24	784.58	1397.72
BENEFIT/COST	G2	A	C	E	D	G4S	B	G1	G4W	THRIE	G3
VALUES	.49	.40	.35	.28	.28	.28	.27	.26	.25	.24	.12

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	D	A	C	E	G3	B	G4W	G1
VALUES	36.73	62.39	63.10	67.53	68.44	68.81	70.24	74.63	82.27	82.46	158.09
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	436.57	440.21	486.00	536.92	648.72	650.75	662.29	681.58	700.94	780.87	1393.10
BENEFIT/COST	G2	A	C	E	G1	D	G4S	B	G4W	THRIE	G3
VALUES	.50	.41	.36	.29	.28	.28	.28	.27	.25	.24	.12

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	D	A	C	E	G3	B	G4W	G1
VALUES	35.10	58.95	59.71	63.39	65.02	65.90	67.58	70.08	79.15	79.34	151.88
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	430.36	438.58	481.86	533.50	646.40	647.62	659.38	678.19	697.81	777.43	1388.56
BENEFIT/COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	.50	.42	.37	.31	.29	.29	.29	.28	.26	.25	.13

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	D	A	C	E	G3	B	G4W	G1
VALUES	33.34	55.94	56.23	59.48	61.98	62.76	64.62	65.83	76.31	76.50	145.20
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	423.68	436.82	477.95	530.46	643.10	644.79	656.23	674.70	694.97	774.41	1384.30
BENEFIT/COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	.51	.43	.37	.33	.30	.29	.29	.28	.26	.25	.13

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	D	A	C	E	G3	B	G4W	G1
VALUES	31.58	52.80	53.25	55.95	59.22	59.53	61.53	61.92	73.67	73.85	138.00
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	416.48	435.06	474.43	527.69	640.01	642.15	653.01	671.27	692.33	771.72	1380.39
BENEFIT/COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	.51	.43	.38	.36	.30	.30	.30	.29	.26	.26	.13

A.149

4R-5-6

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 5-FT SHOULDER

4R-5-8

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 13 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 207.18

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	D	G1	THRIE	A	C	G3	B	G4W
VALUES	37.23	75.54	77.48	77.90	80.88	83.03	86.37	89.62	92.39	99.31	99.52
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	359.36	440.20	504.85	558.09	655.96	667.79	671.37	694.01	718.00	801.51	1410.87
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	.45	.42	.29	.25	.22	.22	.21	.19	.17	.17	.09

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	D	G1	THRIE	A	C	G3	B	G4W
VALUES	36.74	73.66	76.29	76.45	77.27	80.16	84.20	86.58	89.67	96.98	97.19
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	355.74	440.22	502.68	555.06	654.76	665.45	669.93	692.14	715.66	798.44	1408.14
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	.47	.42	.29	.26	.23	.22	.22	.19	.18	.18	.09

A.150

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	G1	D	E	THRIE	A	C	G3	B	G4W
VALUES	36.20	71.59	73.32	74.87	75.02	77.00	81.66	83.29	86.59	94.42	94.62
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	351.79	439.68	500.14	551.77	653.49	662.89	668.34	690.06	713.10	795.48	1405.06
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	.48	.42	.30	.26	.23	.22	.22	.20	.18	.18	.09

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	C	G3	B	G4W
VALUES	35.58	69.04	69.29	73.13	73.56	73.64	78.70	79.77	83.14	91.62	91.82
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	347.51	439.06	497.17	548.25	652.12	660.10	666.60	687.77	710.30	792.03	1401.61
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	.50	.43	.31	.27	.23	.23	.22	.20	.19	.19	.09

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	D	E	A	C	G3	B	G4W
VALUES	34.87	64.49	66.79	69.89	71.22	72.11	75.30	76.05	79.34	88.60	88.80
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	342.97	438.35	493.78	544.52	650.59	657.08	664.64	685.26	707.28	788.36	1397.81
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	.51	.43	.32	.28	.23	.23	.23	.21	.19	.19	.10

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 5-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 13 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 207.18

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
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0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	D	E	A	C	G3	B	G4W
VALUES	34.03	59.87	65.09	66.10	69.14	70.40	71.52	72.24	75.27	85.42	85.62
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	338.34	437.51	489.99	540.71	648.88	653.90	662.61	682.56	704.10	784.58	1393.74
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	.53	.43	.32	.29	.24	.23	.23	.21	.20	.20	.10

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	D	A	E	C	G3	B	G4W
VALUES	33.05	55.48	61.24	62.39	66.88	67.47	68.46	68.50	71.09	82.21	82.40
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	333.96	436.53	485.94	536.97	646.93	650.69	660.36	679.71	700.88	780.87	1389.56
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	.54	.43	.33	.30	.24	.24	.24	.22	.20	.20	.10

A.151

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	D	C	E	G3	B	G4W
VALUES	31.93	51.76	58.31	58.95	63.37	64.45	65.04	66.26	67.02	74.13	74.32
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	330.23	435.40	481.84	533.51	644.74	647.61	657.93	676.78	697.80	777.43	1385.49
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	.56	.43	.34	.30	.24	.24	.24	.23	.21	.21	.11

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	D	C	E	G3	B	G4W
VALUES	30.69	49.01	55.36	55.94	59.47	61.86	61.98	63.27	63.82	76.31	76.49
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	327.49	434.17	477.95	530.46	642.29	644.78	655.34	673.84	694.97	774.41	1381.74
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	.57	.44	.35	.31	.25	.25	.24	.23	.21	.21	.11

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	D	C	E	G3	B	G4W
VALUES	29.47	47.14	52.43	53.25	55.95	59.16	59.22	59.87	61.19	73.67	73.85
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	325.61	432.95	474.43	527.69	639.67	642.15	652.63	670.91	692.33	771.72	1378.35
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	.57	.44	.36	.32	.25	.25	.25	.23	.22	.21	.11

4R-5-8

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 5-FT SHOULDER

4R-5-10

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 15 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 181.36

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	448.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	C	G3	B	G4W
VALUES	34.54	51.37	74.49	76.84	77.48	83.03	86.37	89.62	92.39	99.31	THRIE	G3
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3	G3
VALUES	329.84	438.02	504.85	558.09	655.96	667.79	670.31	692.97	718.00	801.51	1410.87	G3
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3	G3
VALUES	.47	.36	.23	.20	.18	.18	.17	.14	.14	.13	.07	.07

8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	C	G3	B	G4W
VALUES	33.98	50.55	72.83	75.61	76.29	80.16	84.20	86.58	89.67	96.98	THRIE	G3
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3	G3
VALUES	329.02	437.46	502.68	555.06	654.76	665.45	669.08	691.31	715.66	798.54	1408.14	G3
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3	G3
VALUES	.47	.37	.23	.20	.18	.18	.18	.15	.14	.14	.07	.07

6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	C	G3	B	G4W
VALUES	33.41	49.75	70.96	74.23	75.02	77.00	81.66	83.29	86.59	94.42	THRIE	G3
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3	G3
VALUES	328.23	436.89	500.14	551.77	653.49	662.89	667.71	689.43	713.10	795.48	1405.06	G3
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3	G3
VALUES	.47	.37	.24	.21	.18	.18	.18	.15	.15	.14	.07	.07

4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	C	G3	B	G4W
VALUES	32.83	48.95	68.86	72.68	73.56	73.64	78.70	79.77	83.14	91.62	THRIE	G3
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3	G3
VALUES	327.42	436.31	497.17	548.25	652.12	660.10	666.16	687.33	710.30	792.03	1401.61	G3
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3	G3
VALUES	.48	.37	.25	.22	.19	.18	.18	.16	.15	.14	.07	.07

2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	C	G3	B	G4W
VALUES	32.24	48.08	66.51	69.89	70.94	72.11	75.30	76.05	79.34	88.60	THRIE	G3
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3	G3
VALUES	326.56	435.72	493.78	544.52	650.59	657.08	664.42	684.99	707.28	788.36	1397.81	G3
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3	G3
VALUES	.48	.37	.25	.22	.19	.19	.19	.16	.16	.15	.08	.08

A.152

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 5-FT SHOULDER

4R-5-10

PAVEMENT-10-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-10-OBSTACLE DISTANCE = 10 FT

PAVEMENT-10-OBSTACLE DISTANCE = 15 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 181.36

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G1	G4S	THRIE	D	A	C	C	G3	B	G4W
VALUES	31.64	47.10	63.94	66.10	68.94	70.40	71.52	72.24	75.27	85.42	85.62
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	325.58	435.11	489.94	540.71	648.88	653.90	662.47	682.42	704.10	784.58	1393.74
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
VALUES	.48	.37	.26	.23	.19	.19	.17	.16	.15	.08	

STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G1	G4S	THRIE	D	A	C	C	G3	B	G4W
VALUES	31.03	45.96	61.18	62.39	66.82	67.47	68.46	68.50	71.09	82.21	82.40
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	324.44	434.50	485.94	536.97	646.93	650.69	660.30	679.65	700.88	780.87	1389.56
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
VALUES	.49	.37	.27	.24	.20	.19	.19	.17	.16	.08	

A.153

STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G1	G4S	THRIE	A	D	C	E	G3	B	G4W
VALUES	30.40	44.62	58.24	58.95	63.37	64.13	65.04	66.26	67.02	79.13	79.32
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	323.10	433.87	481.84	533.51	644.74	647.61	657.91	674.77	697.80	777.43	1385.49
BENEFIT/COST	G1	G2	A	C	G4S	E	D	B	THRIE	G4W	G3
VALUES	.49	.37	.28	.25	.20	.20	.20	.18	.17	.16	.09

STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G1	G4S	THRIE	A	D	C	E	G3	B	G4W
VALUES	29.75	43.11	55.36	55.94	59.47	61.86	61.98	63.27	63.82	76.31	76.49
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	321.59	433.22	477.95	530.46	642.29	644.78	655.33	673.83	694.97	774.41	1381.74
BENEFIT/COST	G1	G2	A	C	G4S	E	D	B	THRIE	G4W	G3
VALUES	.50	.38	.29	.25	.20	.20	.20	.18	.17	.17	.09

STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G1	G4S	THRIE	A	D	C	E	G3	B	G4W
VALUES	29.07	41.58	52.43	53.25	55.95	59.16	59.22	59.87	61.19	73.67	73.85
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	320.06	432.55	474.43	527.69	639.67	642.15	652.63	670.91	692.33	771.72	1378.35
BENEFIT/COST	G1	G2	A	C	G4S	E	D	B	THRIE	G4W	G3
VALUES	.50	.38	.30	.26	.21	.21	.21	.19	.18	.17	.09

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 5-FT SHOULDER

4R-5-12

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 17 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 159,32

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA											

10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	G3	B	G4W
VALUES	34.54	45.58	74.44	76.84	77.48	83.03	86.37	89.62	89.79	99.31	99.52
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	324.06	438.02	504.85	558.09	655.96	667.79	670.31	692.97	718.00	801.51	1408.27
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.41	.31	.17	.15	.14	.14	.14	.11	.11	.10	.05

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	G3	B	G4W
VALUES	33.98	44.86	72.83	75.61	76.29	80.16	84.20	86.58	87.00	96.98	97.14
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	323.34	437.46	502.68	555.06	654.76	665.45	669.08	691.31	715.56	798.64	1405.48
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.41	.31	.18	.16	.14	.14	.14	.11	.11	.10	.05

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	G3	B	G4W
VALUES	33.41	44.05	70.96	74.23	75.02	77.00	81.66	83.29	83.89	94.42	94.62
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	322.53	436.84	500.14	551.77	653.44	662.84	667.71	689.43	713.10	795.48	1402.37
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.41	.31	.19	.16	.15	.14	.14	.11	.11	.10	.06

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	G3	B	G4W
VALUES	32.83	43.14	68.86	72.68	73.56	73.64	78.70	79.77	80.47	91.62	91.82
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	321.62	436.31	497.17	548.25	652.12	660.10	666.16	687.33	710.30	792.03	1398.95
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.42	.31	.19	.17	.15	.15	.15	.12	.12	.11	.06

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	G3	B	G4W
VALUES	32.24	42.11	66.51	69.89	70.94	72.11	75.30	76.05	76.79	88.60	88.80
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	320.58	435.72	493.78	544.52	650.59	657.08	664.42	684.99	707.28	788.36	1395.27
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.42	.31	.20	.18	.15	.15	.15	.12	.12	.11	.06

A.154

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 5-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 17 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 159,32

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0 STATE COST G1 G2 G3 G4 G5 G6 G7 G8 G9 G10 G11

VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 718.48

SOCIETAL COST G1 G4S THRIE D A C G3 G4W G4S G4W THRIE G3

VALUES 31.64 40.93 63.94 66.10 68.99 70.40 71.52 72.24 72.95 85.42 85.62

TOTAL COST G1 G2 A C E D G4S G4W THRIE G3

VALUES 319.40 435.11 489.99 540.71 648.88 653.90 662.47 682.42 704.10 784.58 1311.43

BENEFIT/COST G1 G2 A C G4S E D B THRIE G4W G3

VALUES .43 .32 .21 .19 .15 .15 .15 .13 .13 .12 .07

-2 STATE COST G1 G2 G3 G4 G5 G6 G7 G8 G9 G10 G11

VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 718.48

SOCIETAL COST G1 G4S THRIE D A C G3 G4W G4S G4W THRIE G3

VALUES 31.03 39.58 61.18 62.39 65.82 67.47 68.46 68.50 69.13 82.21 82.40

TOTAL COST G1 G2 A C E D G4S G4W THRIE G3

VALUES 318.06 434.50 485.94 536.97 646.93 650.69 660.30 679.65 700.98 780.87 1387.60

BENEFIT/COST G1 G2 A C G4S E D B THRIE G4W G3

VALUES .43 .32 .22 .19 .16 .16 .16 .14 .13 .12 .07

-4 STATE COST G1 G2 G3 G4 G5 G6 G7 G8 G9 G10 G11

VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 718.48

SOCIETAL COST G1 G4S THRIE A C G3 G4W G4S G4W THRIE G3

VALUES 30.40 38.06 58.29 58.95 63.37 64.43 65.04 65.54 66.26 79.13 79.32

TOTAL COST G1 G2 A C E D G4S G4W THRIE G3

VALUES 316.54 433.87 481.84 533.51 644.74 647.61 657.91 676.77 697.80 777.43 1384.02

BENEFIT/COST G1 G2 A C G4S E D B THRIE G4W G3

VALUES .44 .32 .23 .20 .16 .16 .16 .14 .13 .13 .07

-6 STATE COST G1 G2 G3 G4 G5 G6 G7 G8 G9 G10 G11

VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 718.48

SOCIETAL COST G1 G4S THRIE A C G3 G4W G4S G4W THRIE G3

VALUES 29.75 36.42 55.36 55.94 59.47 61.86 61.98 62.35 63.82 76.31 76.49

TOTAL COST G1 G2 A C E D G4S G4W THRIE G3

VALUES 314.89 433.22 477.95 530.46 642.29 644.78 655.33 673.83 694.97 774.41 1380.83

BENEFIT/COST G1 G2 A C G4S E D B THRIE G4W G3

VALUES .44 .32 .24 .21 .17 .17 .17 .15 .14 .13 .07

-8 STATE COST G1 G2 G3 G4 G5 G6 G7 G8 G9 G10 G11

VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 718.48

SOCIETAL COST G1 G4S THRIE A C G3 G4W G4S G4W THRIE G3

VALUES 29.07 34.78 52.43 53.25 55.95 59.16 59.22 59.49 61.19 73.67 73.85

TOTAL COST G1 G2 A C E D G4S G4W THRIE G3

VALUES 313.26 432.55 479.43 527.69 639.67 642.15 652.63 670.91 692.33 771.72 1377.96

BENEFIT/COST G1 G2 A C G4S E D B THRIE G4W G3

VALUES .45 .32 .25 .21 .17 .17 .17 .15 .14 .14 .08

A.155

4R-5-12

4R-6-0

4-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 6 FT

SUMMARY OF RESULTS

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 6 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 122.39
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	G2	D	E	THRIE	A	C	G3	B	G4W	G1
VALUES	76.94	77.00	78.58	79.60	82.65	83.54	91.30	96.83	101.66	101.86	187.32
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	465.80	480.48	502.02	559.78	658.08	670.13	672.05	695.42	720.33	801.13	1415.30
BENEFIT/COST	G2	A	E	D	G4S	C	THRIE	B	G4W	G3	G1
VALUES	.11	.09	.07	.07	.07	.07	.07	.04	.03	.02	-.23

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	C	G3	B	G4W	G1
VALUES	73.58	75.42	77.42	78.25	80.24	81.51	88.79	94.38	99.41	99.61	184.71
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	463.18	477.05	499.99	557.27	656.73	667.88	670.90	693.90	718.08	798.72	1412.86
BENEFIT/COST	G2	A	E	G4S	D	C	THRIE	B	G4W	G3	G1
VALUES	.12	.10	.08	.08	.08	.07	.06	.04	.04	.02	-.22

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	C	G3	B	G4W	G1
VALUES	69.85	73.69	76.11	76.85	77.53	79.16	86.03	91.56	96.94	97.14	181.72
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	460.25	473.32	497.64	554.50	655.33	665.42	669.59	692.17	715.61	796.01	1410.03
BENEFIT/COST	G2	A	G4S	E	D	C	THRIE	B	G4W	G3	G1
VALUES	.13	.10	.08	.08	.08	.08	.06	.04	.04	.02	-.21

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	D	E	A	C	G3	B	G4W	G1
VALUES	65.75	71.70	74.50	74.61	75.37	76.44	82.95	88.31	94.20	94.40	178.46
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	456.93	469.23	494.91	551.43	653.84	662.68	668.09	690.17	712.87	792.97	1406.78
BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
VALUES	.14	.11	.08	.08	.08	.08	.07	.05	.05	.03	-.20

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	D	A	E	C	G3	B	G4W	G1
VALUES	61.28	69.40	71.15	72.88	73.32	73.74	79.54	84.59	91.16	91.35	174.69
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	453.17	464.75	491.79	548.01	652.22	659.64	666.35	687.88	709.83	789.63	1403.06
BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
VALUES	.15	.12	.09	.09	.08	.08	.07	.05	.05	.03	-.19

A.156

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 6 FT

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 6 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 122.34

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE

1 2 3 4 5 6 7 8 9 10 11

0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	E	C	G3	B	G4W	G1
VALUES	56.48	66.77	67.55	69.81	70.87	71.92	75.78	80.41	87.81	88.00	170.42
TOTAL COST	G1	G2	A	C	E	B	D	G4S			
VALUES	448.89	459.96	488.29	544.26	650.40	656.29	664.34	685.25	706.47	786.03	1398.89
BENEFIT/COST	G2	A	C	G4S	E	D					
VALUES	.16	.13	.10	.04	.09	.08	.09	.06	.06	.03	.17

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	E	C	G3	B	G4W	G1
VALUES	51.58	63.81	63.82	66.01	68.55	69.84	71.76	75.88	84.21	84.40	165.60
TOTAL COST	G1	G2	A	C	E	B	D	G4S			
VALUES	444.08	455.06	484.49	540.24	648.32	656.69	662.03	682.29	702.87	782.30	1394.35
BENEFIT/COST	G2	A	C	G4S	E	D					
VALUES	.18	.13	.11	.09	.09	.08	.09	.07	.06	.04	.16

A.157

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	D	E	C	G3	B	G4W	G1
VALUES	47.01	60.19	60.58	62.14	65.92	67.45	67.69	71.20	80.52	80.71	160.25
TOTAL COST	G1	G2	A	C	E	B	D	G4S			
VALUES	438.73	450.49	480.62	536.16	645.93	649.00	659.39	679.05	699.18	778.65	1389.67
BENEFIT/COST	G2	A	C	G4S	D						
VALUES	.19	.14	.12	.10	.10	.09	.09	.07	.07	.04	.14

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	D	E	C	G3	B	G4W	G1
VALUES	43.32	56.90	57.20	58.50	63.01	63.84	64.77	66.70	76.98	77.16	154.41
TOTAL COST	G1	G2	A	C	E	B	D	G4S			
VALUES	432.88	446.79	476.97	532.31	643.24	645.46	656.49	675.68	695.64	775.37	1385.18
BENEFIT/COST	G2	A	C	G4S	D						
VALUES	.20	.15	.12	.11	.10	.10	.09	.08	.07	.04	.11

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	E	C	G3	B	G4W	G1
VALUES	40.82	53.88	54.07	55.32	59.99	60.44	61.91	62.66	73.79	73.96	148.03
TOTAL COST	G1	G2	A	C	E	B	D	G4S			
VALUES	426.51	444.29	473.80	528.91	640.38	642.26	653.46	672.36	692.44	772.55	1381.14
BENEFIT/COST	G2	A	C	G4S	D						
VALUES	.20	.16	.13	.11	.11	.10	.10	.09	.08	.05	.09

4R-6-0

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 6-FT SHOULDER

4R-6-2

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 8 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 292.12

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	D	C	G3	A	G4S	E	B	G4W	G2	G1
VALUES	44.21	122.06	122.13	124.55	167.26	172.25	173.86	191.10	191.30	196.58	302.44
TOTAL COST	G1	A	C	G2	D	E	B	G4S	G4W	THRIE	G3
VALUES	580.92	585.73	590.60	600.05	715.54	752.34	759.57	790.73	809.77	812.69	1443.02
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1
VALUES	.36	.30	.29	.28	.24	.20	.19	.18	.16	.13	-.04

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	D	G3	A	G4S	E	B	G4W	G2	G1
VALUES	41.39	112.34	118.03	119.91	162.93	167.70	169.72	186.16	186.36	190.70	302.45
TOTAL COST	G1	A	C	G2	D	E	B	G4S	G4W	THRIE	G3
VALUES	580.93	581.41	585.82	594.17	711.51	748.20	754.64	786.18	804.84	809.87	1438.38
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1
VALUES	.37	.31	.29	.28	.25	.21	.20	.19	.17	.13	-.04

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	D	G3	A	G4S	E	B	G4W	G2	G1
VALUES	88.37	112.13	113.60	114.73	157.88	162.51	165.00	180.51	180.70	184.01	302.46
TOTAL COST	A	C	G1	G2	D	E	B	G4S	G4W	THRIE	G3
VALUES	576.35	580.60	580.94	587.49	707.07	743.48	748.98	780.98	799.18	806.85	1433.20
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1
VALUES	.38	.32	.30	.28	.27	.22	.21	.20	.18	.13	-.04

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	D	G3	A	G4S	E	B	G4W	G2	G1
VALUES	85.08	106.41	108.20	108.94	152.00	156.56	159.61	174.03	174.23	176.42	302.48
TOTAL COST	A	C	G2	G1	D	E	B	G4S	G4W	THRIE	G3
VALUES	570.47	574.88	579.89	580.96	702.17	738.04	742.51	775.04	792.70	803.56	1427.42
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1
VALUES	.40	.33	.31	.29	.29	.23	.22	.21	.19	.14	-.04

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	B	G4W	G2	G1
VALUES	81.50	100.16	102.53	103.31	145.23	149.81	153.49	166.69	166.88	167.85	302.50
TOTAL COST	A	C	G2	G1	D	E	B	G4S	G4W	THRIE	G3
VALUES	563.71	568.63	571.32	580.98	696.78	731.97	735.17	768.28	785.36	799.97	1421.00
BENEFIT/COST	C	A	D	G2	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.41	.35	.32	.31	.29	.24	.23	.22	.20	.14	-.04

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 6-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 8 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 292.12
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
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0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	G2	B	G4W	G1
VALUES	77.61	93.46	95.59	97.49	132.61	142.25	146.62	158.35	158.52	158.71	302.52
TOTAL COST	A	G2	C	G1	D	E	B	G4S	G4W	THRIE	G3
VALUES	556.09	561.82	561.94	581.00	640.96	725.09	727.00	760.72	777.19	796.09	1414.06
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.42	.37	.33	.33	.30	.25	.24	.24	.22	.15	-.04

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	G2	B	G4W	G1
VALUES	73.50	86.60	88.42	91.47	129.31	134.03	139.10	148.15	149.75	149.93	302.55
TOTAL COST	A	G2	C	G1	D	E	B	G4S	G4W	THRIE	G3
VALUES	547.79	551.63	555.08	581.03	684.94	717.58	718.22	752.51	768.41	791.97	1406.89
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.44	.39	.36	.34	.30	.26	.26	.25	.23	.15	-.04

A.159

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	G2	B	G4W	G1
VALUES	69.34	80.12	81.58	85.68	120.74	125.51	131.20	137.74	140.81	140.99	302.57
TOTAL COST	A	G2	C	G1	D	E	B	G4S	G4W	THRIE	G3
VALUES	539.21	541.21	548.59	581.05	679.15	709.29	709.67	743.99	759.47	782.82	1400.06
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.45	.41	.38	.35	.31	.28	.27	.27	.24	.16	-.04

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	G2	B	G4W	G1
VALUES	65.41	74.69	75.82	80.69	112.39	117.14	123.26	127.73	132.30	132.48	302.59
TOTAL COST	A	G2	C	G1	D	E	B	G4S	G4W	THRIE	G3
VALUES	530.87	531.21	543.17	581.07	679.16	700.78	701.73	735.62	750.96	783.89	1394.29
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.46	.43	.41	.36	.32	.29	.28	.28	.26	.16	-.04

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	G2	B	G4W	G1
VALUES	61.91	70.65	71.48	76.79	104.53	109.16	115.47	124.44	124.47	124.65	302.60
TOTAL COST	A	G2	C	G1	D	E	B	G4S	G4W	THRIE	G3
VALUES	521.92	523.00	539.13	581.08	670.26	692.45	693.94	727.64	743.12	780.38	1389.95
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.47	.45	.43	.36	.32	.31	.30	.29	.27	.17	-.04

4R-6-2

4R-6-4

SUMMARY OF RESULTS 4-LANE RURAL ROAD WITH 6-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 10 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 254.24
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	A	THRIE	E	C	G3	B	G4W	G1
VALUES	77.00	81.32	82.95	83.54	84.26	89.18	91.30	96.83	106.70	106.90	249.45
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	480.48	502.02	527.92	554.78	667.65	675.18	676.43	725.38	802.74	1415.30	
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G3	G1
VALUES	.44	.41	.35	.29	.29	.28	.26	.24	.24	.12	.02
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	D	THRIE	E	C	G3	B	G4W	G1
VALUES	73.58	79.60	81.51	81.59	82.10	87.13	88.79	94.38	104.28	104.47	247.94
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	477.05	499.99	526.41	557.27	665.61	672.75	675.07	722.95	800.58	1412.86	
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G3	G1
VALUES	.45	.41	.35	.29	.29	.28	.26	.24	.24	.12	.02
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	THRIE	D	E	C	G3	A	G4W	G1
VALUES	69.85	77.64	79.16	79.41	80.06	85.17	86.03	91.56	101.60	101.80	246.31
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	473.32	497.64	524.79	554.50	663.65	670.08	673.54	720.27	798.09	1410.03	
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G3	G1
VALUES	.46	.42	.36	.29	.29	.29	.27	.25	.24	.12	.03
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	THRIE	D	E	C	G3	B	G4W	G1
VALUES	65.75	75.41	76.44	76.74	78.32	82.95	83.24	88.31	98.63	98.82	244.56
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	469.23	494.91	523.04	551.43	661.72	667.10	671.80	717.30	795.21	1406.78	
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G3	G1
VALUES	.47	.42	.37	.30	.30	.29	.27	.25	.25	.13	.03
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	THRIE	D	E	C	G3	B	G4W	G1
VALUES	61.28	72.85	73.32	73.45	76.33	79.54	81.29	84.59	95.30	95.50	242.67
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	464.75	491.79	521.14	548.01	659.77	663.78	669.81	713.97	791.93	1403.06	
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G3	G1
VALUES	.48	.43	.37	.30	.30	.29	.28	.26	.25	.13	.04

A.160

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 6-FT SHOULDER

4R-6-4

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 10 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 254,24

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE
OF CURVE

J 1 2 3 4 5 6 7 8 9 10 11

0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	A	G4S	D	C	E	G3	B	G4W	G1
VALUES	56.48	69.77	69.81	69.95	74.05	75.78	79.25	80.41	91.63	91.82	240.60
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	459.96	488.29	519.08	544.26	652.73	660.10	667.53	688.93	710.29	788.25	1394.89
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G3	G1
VALUES	.49	.44	.38	.30	.30	.30	.29	.26	.26	.13	.05

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	A	G4S	D	C	E	G3	B	G4W	G1
VALUES	51.58	65.79	66.01	66.72	71.45	71.76	75.88	77.04	87.65	87.84	238.34
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	455.06	484.49	516.81	540.24	655.52	656.13	664.93	685.19	706.31	784.26	1394.35
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G3	G1
VALUES	.50	.45	.39	.31	.31	.30	.29	.27	.26	.14	.06

A.161

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	A	G4S	D	C	E	G3	B	G4W	G1
VALUES	47.01	61.72	62.14	63.20	67.69	68.53	71.20	74.59	83.54	83.72	235.84
TOTAL COST	G2	A	G1	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	450.49	480.62	514.32	536.16	652.02	653.06	662.00	681.67	702.20	780.20	1389.67
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G3	G1
VALUES	.51	.46	.40	.31	.31	.31	.30	.28	.27	.14	.07

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	A	G4S	D	C	E	G3	B	G4W	G1
VALUES	43.32	57.87	58.50	59.52	63.84	65.32	66.70	71.85	79.53	79.71	233.09
TOTAL COST	G2	A	G1	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	446.79	476.97	511.57	532.31	648.01	650.33	658.79	678.00	698.19	776.35	1385.18
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G3	G1
VALUES	.52	.47	.41	.32	.32	.31	.31	.28	.27	.14	.08

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	A	G4S	D	C	E	G3	B	G4W	G1
VALUES	40.82	54.50	55.32	55.87	60.44	61.95	62.66	68.89	75.84	76.02	230.04
TOTAL COST	G2	A	G1	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	444.29	473.80	508.52	528.91	644.32	647.37	655.43	674.34	694.49	772.98	1381.14
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G3	G1
VALUES	.53	.48	.41	.32	.32	.32	.31	.29	.28	.15	.09

4R-6-6

SUMMARY OF RESULTS 4-LANE RURAL ROAD WITH 6-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 221.67
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11
 PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	C	B	G4W	G1
VALUES	41.94	76.94	78.58	79.60	82.65	85.82	88.86	97.17	99.50	177.78
TOTAL COST	G2	G1	A	C	E	B	D	G4S	THRIE	G3
VALUES	445.42	456.26	504.30	557.33	658.08	667.77	672.05	695.42	801.13	1415.64
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1
VALUES	.45	.32	.28	.25	.24	.23	.22	.20	.16	.09

8 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	C	B	G4W	G1
VALUES	41.10	75.42	77.42	78.25	80.24	83.85	86.28	94.65	96.99	175.47
TOTAL COST	G2	G1	A	C	E	B	D	G4S	THRIE	G3
VALUES	444.58	453.94	502.32	558.76	656.73	665.46	670.90	693.90	795.66	1413.13
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1
VALUES	.45	.33	.29	.25	.24	.24	.22	.20	.17	.10

6 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	C	B	G4W	G1
VALUES	40.20	73.69	76.11	76.85	77.53	81.53	83.48	91.77	94.48	172.78
TOTAL COST	G2	G1	A	C	E	B	D	G4S	THRIE	G3
VALUES	443.68	451.25	500.01	551.96	655.33	662.96	669.59	692.17	796.01	1410.24
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1
VALUES	.45	.33	.29	.25	.25	.24	.22	.21	.18	.10

4 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	D	E	A	C	B	G4W	G1
VALUES	39.23	71.70	74.50	74.61	75.37	78.79	80.42	88.45	91.76	169.64
TOTAL COST	G2	G1	A	C	E	B	D	G4S	THRIE	G3
VALUES	442.70	448.12	497.27	548.90	653.84	660.24	668.09	690.17	792.97	1406.93
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1
VALUES	.45	.34	.30	.25	.25	.24	.23	.21	.19	.10

2 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	D	E	A	C	B	G4W	G1
VALUES	38.15	69.40	71.15	72.88	73.74	75.59	77.10	84.68	89.00	166.00
TOTAL COST	G2	G1	A	C	E	B	D	G4S	THRIE	G3
VALUES	441.62	444.48	494.06	545.57	652.22	657.28	666.35	687.89	797.47	1403.16
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1
VALUES	.45	.35	.31	.26	.25	.25	.23	.21	.20	.10

A.162

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 6-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT										
PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 221.67										
AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT										
PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10 11
0 STATE COST										
VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE G3
SOCIETAL COST	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48 1318.48
VALUES	G2	G4S	THRIE	D	A	E	C	G3	B	G4W G1
TOTAL COST	36.93	66.77	67.55	70.87	71.90	71.92	73.53	80.46	85.64	85.83 161.80
VALUES	G1	G2	A	C	E	B	D	G4S	G4W	THRIE G3
BENEFIT/COST	440.28	440.41	440.38	532.01	650.40	654.12	664.34	685.25	704.31	786.03 1389.94
VALUES	G2	A	C	E	D	G4S	B	G4W	G1	THRIE G3
VALUES	.46	.36	.32	.26	.25	.25	.24	.22	.22	.21 .11
-2 STATE COST										
VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE G3
SOCIETAL COST	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48 1318.48
VALUES	G2	G4S	THRIE	A	D	C	E	G3	B	G4W G1
TOTAL COST	35.56	63.81	63.82	67.81	68.55	69.84	69.84	75.90	82.35	82.54 157.02
VALUES	G1	G2	A	C	E	B	D	G4S	G4W	THRIE G3
BENEFIT/COST	435.50	439.04	486.28	538.31	648.32	650.83	662.03	682.29	701.01	782.30 1394.37
VALUES	G2	A	C	E	D	G4S	B	G1	G4W	THRIE G3
VALUES	.46	.37	.32	.26	.26	.26	.25	.23	.22	.22 .11
-4 STATE COST										
VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE G3
SOCIETAL COST	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48 1318.48
VALUES	G2	THRIE	G4S	A	D	C	E	G3	B	G4W G1
TOTAL COST	34.02	60.19	60.58	63.52	65.92	66.21	67.45	71.20	79.10	79.28 151.68
VALUES	G1	G2	A	C	E	B	D	G4S	G4W	THRIE G3
BENEFIT/COST	430.16	437.50	481.99	534.69	645.93	647.57	659.39	679.05	697.76	778.66 1389.68
VALUES	G2	A	C	E	D	G4S	G1	B	G4W	THRIE G3
VALUES	.47	.38	.33	.27	.26	.26	.25	.23	.23	.22 .11
-6 STATE COST										
VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE G3
SOCIETAL COST	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48 1318.48
VALUES	G2	THRIE	G4S	A	C	D	E	G3	B	G4W G1
TOTAL COST	32.34	56.90	57.20	59.36	62.90	63.01	64.77	66.70	76.08	76.26 145.83
VALUES	G1	G2	A	C	E	B	D	G4S	G4W	THRIE G3
BENEFIT/COST	424.31	435.82	477.84	531.38	643.24	644.56	656.49	675.68	694.74	775.37 1385.18
VALUES	G2	A	C	G1	E	D	G4S	B	G4W	THRIE G3
VALUES	.47	.39	.34	.27	.27	.27	.27	.26	.24	.23 .12
-8 STATE COST										
VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE G3
SOCIETAL COST	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48 1318.48
VALUES	G2	G4S	THRIE	A	D	C	E	G3	B	G4W G1
TOTAL COST	30.64	53.88	54.07	55.70	59.49	60.03	61.91	62.66	73.39	73.57 139.45
VALUES	G1	G2	A	C	E	B	D	G4S	G4W	THRIE G3
BENEFIT/COST	417.92	434.11	474.18	525.50	640.38	641.87	653.46	672.36	692.04	772.55 1381.14
VALUES	G2	A	C	G1	E	D	G4S	B	G4W	THRIE G3
VALUES	.47	.40	.35	.30	.28	.27	.27	.26	.24	.23 .12

4R-6-6

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 6-FT SHOULDER

4R-6-8

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 193.76

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	G1	THRIE	A	C	B	G4W
VALUES	35.82	74.58	76.13	76.37	82.18	82.65	84.74	89.88	91.60	98.24
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	360.65	439.30	503.22	558.35	654.85	666.71	669.61	693.05	716.92	801.13
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	.40	.39	.26	.22	.20	.20	.19	.17	.15	.08

8 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	G1	THRIE	A	C	B	G4W
VALUES	35.31	73.00	74.91	75.16	78.71	80.24	82.98	87.11	89.34	96.13
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	357.19	438.79	501.46	555.58	653.64	664.61	668.39	691.48	714.81	798.72
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	.41	.39	.26	.23	.21	.20	.20	.17	.16	.08

6 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	G1	THRIE	A	C	B	G4W
VALUES	34.77	71.23	73.57	73.93	74.94	77.53	80.87	84.11	86.73	93.83
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	353.41	438.25	499.34	552.58	652.41	662.31	667.04	689.71	712.51	796.01
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	.43	.39	.27	.23	.21	.20	.20	.18	.16	.08

4 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	G1	D	E	THRIE	A	C	B	G4W
VALUES	34.18	69.25	70.80	72.08	72.65	74.50	78.33	80.87	83.72	91.30
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	349.28	437.66	496.80	549.34	651.12	659.78	665.56	687.73	709.97	792.97
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	.44	.40	.28	.24	.21	.21	.20	.18	.17	.08

2 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	B	G4W
VALUES	33.51	66.28	67.04	70.44	71.15	71.27	75.29	77.38	80.30	88.51
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	344.76	436.99	493.77	545.85	649.74	656.99	663.91	685.52	707.18	789.63
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	.46	.40	.28	.25	.21	.21	.20	.19	.17	.09

A.164

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 6-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 193,76

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	D	E	A	C	G3	B	G4W
VALUES	32.74	61.45	61.60	67.55	68.62	69.75	71.74	73.69	76.46	85.48	85.67
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	339.93	436.22	490.22	542.16	648.23	653.96	652.10	683.08	704.15	786.03	1394.94
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.48	.40	.29	.26	.21	.21	.21	.19	.18	.17	.09

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	D	E	A	C	G3	B	G4W
VALUES	31.83	56.52	61.95	63.82	66.62	67.74	68.05	69.90	72.31	82.28	82.47
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	334.99	435.31	486.21	538.38	646.52	650.76	660.10	680.43	700.94	782.30	1390.79
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.49	.40	.30	.26	.22	.21	.21	.20	.18	.18	.09

A.165

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	C	G3	B	G4W
VALUES	30.78	51.91	59.15	60.19	63.49	64.44	66.11	66.23	68.08	79.08	79.26
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	330.38	434.25	481.97	534.70	644.59	647.55	657.92	677.63	697.74	778.66	1386.55
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.51	.40	.31	.27	.22	.22	.22	.20	.19	.19	.10

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	C	G3	B	G4W
VALUES	29.61	48.18	56.30	56.90	59.36	62.08	62.91	63.93	64.06	76.08	76.26
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	326.65	433.09	472.84	531.38	642.41	644.56	655.56	674.78	694.74	775.37	1382.54
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.52	.41	.32	.28	.22	.22	.22	.21	.19	.19	.10

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	C	G3	B	G4W
VALUES	28.44	45.65	53.49	54.07	55.70	58.58	60.03	60.53	61.54	73.39	73.57
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	324.12	431.92	474.18	528.50	640.02	641.87	653.06	671.96	692.04	772.55	1374.01
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.53	.41	.33	.29	.23	.23	.23	.21	.19	.19	.10

4R-6-8

4R-6-10

4-LANE RURAL ROAD WITH 6-FT SHOULDER

SUMMARY OF RESULTS

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT	GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT
PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT	SOCIETAL COST WITH NO GUARDRAIL = \$ 169.90
AADT = 1000	GUARDRAIL LENGTH = 100 FT
	OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	G3	B	G4W
VALUES	33.25	50.80	73.50	75.04	76.37	82.65	84.74	89.88	91.50	98.24	98.44
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	329.27	436.73	503.22	558.35	654.85	666.71	668.51	691.48	716.92	801.13	1410.07
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.43	.34	.20	.17	.16	.16	.16	.13	.12	.12	.06
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	G3	B	G4W
VALUES	32.67	49.61	72.13	74.03	75.16	80.24	82.98	87.11	89.34	96.13	96.33
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	328.08	436.15	501.46	555.58	653.64	664.61	667.51	690.61	714.81	798.72	1407.81
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.43	.34	.21	.18	.16	.16	.16	.13	.12	.12	.06
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	G3	B	G4W
VALUES	32.10	48.52	70.57	72.89	73.93	77.53	80.87	84.11	86.73	93.83	94.03
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	326.99	435.57	499.34	552.58	652.41	662.31	666.37	689.05	712.51	796.01	1405.20
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.44	.34	.21	.18	.17	.16	.16	.13	.12	.12	.06
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	G3	B	G4W
VALUES	31.52	47.49	68.78	71.60	72.65	74.50	78.33	80.87	83.22	91.30	91.49
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	325.97	435.00	496.80	549.34	651.12	659.78	665.08	687.26	709.97	792.97	1402.20
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.44	.34	.22	.19	.17	.17	.16	.14	.13	.13	.07
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	G3	B	G4W
VALUES	30.45	46.48	66.75	70.13	71.15	71.27	75.29	77.38	80.30	88.51	88.70
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	324.96	434.42	493.77	545.85	649.74	656.44	663.61	685.22	707.18	789.63	1398.77
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.44	.34	.23	.20	.17	.17	.17	.14	.13	.13	.07

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 6-FT SHOULDER

4R-6-10

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 169,90

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
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0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	D	E	A	C	G3	B	G4W
VALUES	30.38	45.43	64.44	67.55	68.46	69.75	71.74	73.69	76.46	85.48	85.67
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	323.91	433.85	490.22	542.16	648.23	653.96	661.93	682.92	704.15	786.03	1394.94
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.45	.35	.23	.21	.17	.17	.17	.15	.14	.14	.07

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	D	A	E	C	G3	B	G4W
VALUES	29.80	44.28	61.88	63.82	66.55	67.74	69.05	69.90	72.31	82.28	82.47
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	322.76	433.28	486.21	538.38	646.52	650.76	660.03	680.36	700.94	782.30	1390.79
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
VALUES	.45	.35	.24	.21	.18	.17	.17	.15	.15	.14	.07

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	C	G3	B	G4W
VALUES	29.23	42.98	59.13	60.19	63.49	64.42	66.11	66.23	68.08	79.08	79.26
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	321.46	432.70	481.97	534.70	644.59	647.55	657.90	677.61	697.74	778.66	1386.55
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
VALUES	.46	.35	.25	.22	.18	.18	.18	.16	.15	.15	.08

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	D	C	E	G3	B	G4W
VALUES	28.63	41.53	56.30	56.90	59.36	62.08	62.91	63.93	64.06	76.08	76.26
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	320.01	432.11	477.84	531.38	642.41	644.56	655.55	674.77	694.74	775.37	1382.54
BENEFIT/COST	G1	G2	A	C	G4S	E	D	B	THRIE	G4W	G3
VALUES	.46	.35	.26	.23	.18	.18	.18	.17	.16	.15	.08

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	D	C	E	G3	B	G4W
VALUES	28.01	40.04	53.48	54.07	55.70	59.58	60.03	60.53	61.54	73.39	73.57
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	318.52	431.49	474.18	528.50	640.02	641.87	653.06	671.96	692.04	772.55	1379.01
BENEFIT/COST	G1	G2	A	C	G4S	E	D	B	THRIE	G4W	G3
VALUES	.47	.35	.27	.23	.19	.19	.19	.17	.16	.16	.08

A.167

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 6-FT SHOULDER

4R-6-12

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 18 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 149.56
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11
 PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	G3	C	B	G4W
VALUES	33.25	43.75	73.50	75.04	76.37	82.65	84.74	89.11	89.88	98.24	98.44
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	322.22	436.73	503.22	558.35	654.85	666.71	668.51	691.98	716.92	801.13	1407.59
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.38	.29	.15	.13	.13	.13	.12	.09	.09	.08	.05

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	G3	C	B	G4W
VALUES	32.67	43.07	72.13	74.03	75.16	80.24	82.98	86.78	87.11	96.13	96.33
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	321.54	436.15	501.46	555.58	653.64	664.61	667.51	690.61	714.81	798.72	1405.26
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.38	.29	.16	.13	.13	.13	.13	.10	.09	.09	.05

A.168

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	G3	B	G4W
VALUES	32.10	42.32	70.57	72.89	73.93	77.53	80.87	84.11	84.14	93.83	94.03
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	320.79	435.57	499.34	552.58	652.41	662.31	666.37	689.05	712.51	796.01	1405.61
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.39	.29	.16	.14	.13	.13	.13	.10	.10	.09	.05

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	G3	B	G4W
VALUES	31.52	41.47	68.78	71.60	72.65	74.50	78.33	80.87	81.15	91.30	91.49
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	319.95	435.00	496.80	549.34	651.12	659.78	665.08	687.26	709.97	792.97	1396.63
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.39	.29	.17	.15	.13	.13	.13	.10	.10	.09	.05

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	G3	B	G4W
VALUES	30.95	40.52	66.75	70.13	71.15	71.27	75.29	77.38	77.81	88.51	88.70
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	318.99	434.42	493.77	545.85	649.74	656.99	663.61	685.22	707.18	789.63	1396.29
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.39	.29	.18	.15	.14	.13	.13	.11	.11	.10	.05

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 6-FT SHOULDER

4R-6-12

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 18 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 149,56

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	D	E	A	C	G3	B	G4W
VALUES	30.38	39.42	64.44	67.55	68.46	69.75	71.74	73.69	74.17	85.48	85.67
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	317.90	433.85	490.22	542.16	648.23	653.96	661.93	682.92	704.15	786.03	1392.65
BENEFIT/COST	G1	G2	A	C	E	G4S	D	THRIE	B	G4W	G3
VALUES	.40	.30	.14	.14	.16	.14	.14	.11	.11	.10	.06
-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	D	A	E	C	G3	B	G4W
VALUES	29.80	38.17	61.88	63.82	66.55	67.74	68.05	69.90	70.35	82.28	82.47
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	316.64	433.28	486.21	538.38	646.52	650.76	660.03	680.36	700.94	782.30	1388.83
BENEFIT/COST	G1	G2	A	C	G4S	E	D	THRIE	B	G4W	G3
VALUES	.40	.30	.20	.14	.17	.14	.14	.12	.12	.11	.06
-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	C	G3	B	G4W
VALUES	29.23	36.74	59.13	60.19	63.49	64.42	66.11	66.23	66.57	79.08	79.26
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	315.21	432.70	481.97	534.70	644.59	647.55	657.90	672.61	697.74	778.66	1385.05
BENEFIT/COST	G1	G2	A	C	G4S	E	D	THRIE	B	G4W	G3
VALUES	.41	.30	.21	.18	.15	.14	.14	.12	.12	.11	.06
-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	D	C	G3	E	B	G4W
VALUES	28.63	35.16	56.30	56.90	59.36	62.08	62.91	63.12	63.93	76.08	76.26
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	313.64	432.11	477.84	531.38	642.41	644.56	655.55	674.77	694.74	775.37	1381.59
BENEFIT/COST	G1	G2	A	C	G4S	E	D	THRIE	B	G4W	G3
VALUES	.41	.30	.22	.18	.15	.15	.15	.13	.13	.12	.07
-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	D	C	G3	E	B	G4W
VALUES	28.01	33.56	53.48	54.07	55.70	59.58	60.03	60.12	61.54	73.39	73.57
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	312.04	431.49	474.18	528.50	640.02	641.87	653.06	671.96	692.04	772.55	1378.60
BENEFIT/COST	G1	G2	A	C	G4S	E	D	THRIE	B	G4W	G3
VALUES	.42	.30	.22	.19	.16	.15	.15	.13	.13	.12	.07

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 7 FT

4R-7-0

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 7 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 114.09

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	G2	E	THRIE	A	C	G3	B	G4W	G1
VALUES	75.01	76.05	77.47	78.22	80.96	81.22	80.50	94.67	99.76	99.95	180.96
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	459.43	481.45	499.69	558.98	656.69	668.23	669.53	693.48	718.43	799.44	1413.14
BENEFIT/COST	G2	A	D	G4S	E	C	THRIE	B	G4W	G3	G1
VALUES	.09	.08	.06	.06	.06	.05	.05	.03	.02	.01	-.24
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	G2	E	THRIE	A	C	G3	B	G4W	G1
VALUES	73.70	74.61	75.04	76.26	78.96	79.51	88.15	92.62	97.65	97.84	178.67
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	457.15	478.08	497.49	556.62	655.23	666.12	668.52	692.18	716.31	797.43	1411.04
BENEFIT/COST	G2	A	D	G4S	E	C	THRIE	B	G4W	G3	G1
VALUES	.10	.08	.07	.07	.06	.06	.05	.03	.03	.02	-.23
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	G2	E	THRIE	A	C	G3	B	G4W	G1
VALUES	70.98	72.23	73.93	75.31	76.67	77.53	85.60	90.25	95.36	95.55	176.15
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	454.63	478.46	496.00	554.07	653.78	663.84	667.41	690.71	714.03	795.15	1408.72
BENEFIT/COST	G2	A	G4S	D	E	C	THRIE	B	G4W	G3	G1
VALUES	.11	.09	.07	.07	.07	.07	.05	.03	.03	.02	-.22
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	G2	E	THRIE	A	C	G3	B	G4W	G1
VALUES	67.04	70.54	72.66	73.83	74.07	75.20	82.79	87.47	92.86	93.04	173.33
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	451.80	470.51	493.67	551.26	652.30	661.33	666.14	689.02	711.52	792.55	1405.95
BENEFIT/COST	G2	A	G4S	D	E	C	THRIE	B	G4W	G3	G1
VALUES	.12	.09	.07	.07	.07	.07	.06	.04	.03	.02	-.21
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	G2	E	THRIE	A	C	G3	B	G4W	G1
VALUES	62.69	68.57	71.14	71.19	72.27	72.46	76.64	84.22	90.06	90.25	170.14
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	448.61	466.17	490.94	548.12	650.74	658.54	664.66	687.04	708.72	789.61	1402.70
BENEFIT/COST	G2	A	G4S	C	E	D	THRIE	B	G4W	G3	G1
VALUES	.13	.10	.07	.07	.07	.07	.06	.04	.04	.02	-.20

A.170

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 7 FT

PAVEMENT-10-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-10-OBSTACLE DISTANCE = 0 FT

PAVEMENT-10-OBSTACLE DISTANCE = 7 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 114.09

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE

4R-7-0

OF CURVE

1 2 3 4 5 6 7 8 9 10 11

A.171

0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	A	D	E	C	G3	B	G4W	G1
	VALUES	57.92	66.25	67.87	69.27	69.46	70.57	76.13	80.45	86.94	87.12	166.51
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	444.99	461.40	487.75	544.61	649.05	655.42	662.93	684.73	705.60	786.35	1398.92
	BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
	VALUES	.14	.11	.08	.08	.08	.08	.06	.05	.04	.03	-.19
-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	A	D	E	C	G3	B	G4W	G1
	VALUES	52.81	63.58	64.33	65.67	67.43	68.67	72.25	76.17	83.49	83.67	162.38
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	440.86	456.29	484.14	540.73	647.15	651.97	660.90	682.05	702.15	782.81	1394.65
	BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
	VALUES	.15	.12	.09	.08	.08	.08	.07	.05	.05	.03	-.17
-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	A	D	E	C	G3	B	G4W	G1
	VALUES	47.68	60.56	60.69	61.79	65.08	66.52	68.15	71.54	79.82	80.00	157.74
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	436.21	451.16	480.26	536.63	647.99	648.30	658.55	679.04	698.47	779.17	1390.02
	BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
	VALUES	.16	.12	.10	.09	.08	.08	.07	.06	.06	.03	-.16
-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	THRIE	G4S	A	D	E	C	G3	B	G4W	G1
	VALUES	43.11	57.22	57.34	57.95	62.44	64.09	64.12	66.90	76.17	76.34	152.60
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	431.08	446.59	476.43	532.59	642.57	644.65	655.92	675.82	694.82	775.70	1385.38
	BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
	VALUES	.18	.13	.11	.09	.09	.09	.08	.07	.06	.04	-.14
-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	A	D	E	C	G3	B	G4W	G1
	VALUES	39.79	54.15	54.23	54.59	59.67	60.55	61.50	62.70	72.88	73.05	147.01
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	425.48	443.27	473.06	529.03	639.97	641.36	653.14	672.63	691.53	772.71	1381.18
	BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
	VALUES	.18	.14	.11	.10	.09	.09	.08	.07	.07	.04	-.12

A.171

4R-7-0

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 7-FT SHOULDER

4R-7-2

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 9 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 272.47
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	D	C	G3	A	G4S	E	B	G4W	G2	G1
VALUES	94.11	122.55	123.42	124.56	162.81	169.79	170.82	187.76	187.95	196.31	281.98
TOTAL COST	G1	A	C	G2	D	E	B	G4S	G4W	THRIE	G3
VALUES	560.46	581.28	591.90	599.78	716.03	749.29	756.24	788.26	806.43	812.58	1493.03
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1
VALUES	.32	.26	.25	.25	.19	.18	.17	.15	.14	.11	-.03
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	D	C	G3	A	G4S	E	B	G4W	G2	G1
VALUES	91.31	118.73	118.84	120.36	159.43	165.97	167.32	183.67	183.86	191.53	281.99
TOTAL COST	G1	A	C	G2	D	E	B	G4S	G4W	THRIE	G3
VALUES	560.47	577.91	587.32	595.01	712.21	745.80	752.14	784.45	802.33	809.78	1438.83
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1
VALUES	.33	.27	.26	.26	.20	.18	.17	.16	.14	.12	-.03
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	D	G3	A	G4S	E	B	G4W	G2	G1
VALUES	88.36	113.90	114.57	115.68	155.42	161.60	163.35	178.94	179.13	186.04	282.01
TOTAL COST	G1	A	C	G2	D	E	B	G4W	G4W	THRIE	G3
VALUES	560.48	573.89	582.38	589.52	708.04	741.83	747.42	780.08	797.60	806.83	1434.15
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1
VALUES	.34	.28	.27	.26	.21	.19	.18	.16	.15	.12	-.03
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	D	G3	A	G4S	E	B	G4W	G2	G1
VALUES	85.20	108.50	108.97	110.42	150.64	156.57	158.80	173.46	173.65	179.70	282.02
TOTAL COST	G1	A	C	G2	D	E	B	G4W	G4W	THRIE	G3
VALUES	560.50	569.12	576.98	583.18	703.45	737.27	741.94	775.04	792.13	803.67	1428.90
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1
VALUES	.35	.29	.27	.26	.23	.20	.19	.17	.16	.12	-.03
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	D	G3	A	G4S	E	B	G4W	G2	G1
VALUES	81.77	102.56	104.50	104.88	144.99	150.75	153.55	167.12	167.31	172.39	282.05
TOTAL COST	G1	A	C	G2	D	E	B	G4W	G4W	THRIE	G3
VALUES	560.52	563.46	571.04	575.87	698.35	732.02	735.60	769.23	785.78	800.25	1422.98
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1
VALUES	.36	.30	.28	.27	.25	.21	.20	.19	.17	.13	-.03

A.172

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 7-FT SHOULDER

PAVEMENT-10-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-10-OBSTACLE DISTANCE = 2 FT

PAVEMENT-10-OBSTACLE DISTANCE = 9 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 272.47

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11	
0	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA											

STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	B	G4W	G2	G1
VALUES	78.03	96.05	97.89	99.24	138.39	144.07	147.53	154.85	160.04	164.03	282.07
TOTAL COST	A	G1	C	G2	D	E	B	G4S	G4W	THRIE	G3
VALUES	556.86	560.55	564.53	567.51	692.72	726.00	728.33	762.55	778.51	796.50	1416.37
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1
VALUES	.38	.32	.29	.27	.22	.21	.20	.18	.13	.03	

STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	B	G4W	G2	G1
VALUES	73.98	89.08	90.71	93.16	130.88	136.55	140.73	151.72	151.90	154.69	282.10
TOTAL COST	A	C	G2	G1	D	E	B	G4S	G4W	THRIE	G3
VALUES	549.36	557.56	558.16	560.58	686.64	719.21	720.20	755.03	770.38	792.46	1409.19
BENEFIT/COST	C	A	D	G2	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.39	.34	.30	.29	.28	.23	.22	.21	.19	.14	.03

STATE COST	G1	G2	A	C	R	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	B	G4W	G2	G1
VALUES	69.74	82.05	83.39	86.95	122.74	128.43	133.33	143.04	143.21	144.69	282.14
TOTAL COST	A	G2	C	G1	D	B	E	G4S	G4W	THRIE	G3
VALUES	541.22	548.16	550.52	560.61	680.43	711.51	711.81	746.90	761.69	788.22	1401.86
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.41	.36	.32	.31	.28	.24	.23	.23	.21	.14	.03

STATE COST	G1	G2	A	C	R	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	B	G4W	G2	G1
VALUES	65.60	75.48	76.70	81.21	114.52	120.19	125.20	134.44	134.61	134.71	282.17
TOTAL COST	A	G2	C	G1	D	B	E	G4S	G4W	THRIE	G3
VALUES	533.00	538.19	544.16	560.64	674.69	702.91	704.18	738.67	753.08	784.08	1345.17
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.42	.38	.34	.32	.29	.25	.25	.24	.22	.15	.03

STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	B	G4W	G2	G1
VALUES	61.91	70.78	71.48	76.62	106.84	112.41	118.28	125.49	126.58	126.75	282.19
TOTAL COST	A	G2	C	G1	D	B	E	G4S	G4W	THRIE	G3
VALUES	525.31	528.97	539.26	560.67	670.09	695.05	696.25	730.88	745.22	780.39	1389.96
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.43	.40	.36	.33	.29	.27	.26	.26	.24	.15	.03

A.173

4R-7-2

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 7-FT SHOULDER

4R-7-4

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 11 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 237.33

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	A	THRIE	E	C	G3	B	G4W	G1
VALUES	77.97	79.33	80.36	81.22	82.47	89.40	90.50	94.67	104.72	104.91	239.21
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	481.45	499.69	517.69	558.98	667.88	673.20	673.84	697.80	723.39	800.95	1413.14
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G3	G1
VALUES	.39	.37	.31	.26	.26	.26	.23	.22	.21	.11	-.01

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	A	THRIE	E	C	G3	B	G4W	G1
VALUES	74.61	77.84	79.18	79.51	80.69	86.91	88.15	92.62	102.44	102.63	238.00
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	478.08	497.99	516.47	556.62	665.39	670.92	672.65	696.32	721.11	799.17	1411.09
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G3	G1
VALUES	.40	.38	.32	.27	.26	.26	.24	.22	.22	.11	-.00

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	A	THRIE	E	C	G3	B	G4W	G1
VALUES	70.98	76.17	77.53	77.86	78.63	84.57	85.60	90.25	99.98	100.16	236.68
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	474.46	496.00	515.16	554.07	663.04	668.45	671.34	694.64	718.64	797.10	1408.72
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G3	G1
VALUES	.41	.38	.32	.27	.26	.26	.24	.22	.22	.11	.00

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	THRIE	D	E	C	G3	B	G4W	G1
VALUES	67.04	74.25	75.20	76.20	76.37	82.34	82.79	87.47	97.25	97.43	235.26
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	470.51	493.67	513.73	551.26	660.81	665.72	669.84	692.72	715.91	794.67	1405.95
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G3	G1
VALUES	.42	.39	.33	.27	.27	.26	.25	.23	.22	.11	.01

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	THRIE	D	E	C	G3	B	G4W	G1
VALUES	62.69	72.03	72.46	73.35	74.65	79.64	80.19	84.22	94.19	94.38	233.71
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	466.17	490.94	512.18	548.12	658.66	662.67	668.13	690.50	712.85	791.82	1402.70
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G3	G1
VALUES	.43	.39	.34	.27	.27	.27	.25	.23	.23	.12	.01

A.174

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 7-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 11 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 237.33

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

0	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	G4S	THRIE	D	C	E	G3	B	G4W	G1	
VALUES	57.92	69.27	69.46	70.03	72.66	76.13	78.05	80.45	90.77	90.45	232.01	
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3	
VALUES	461.40	487.75	510.48	544.61	656.53	659.24	666.14	687.93	709.42	788.51	1388.92	
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G3	G1		
VALUES	.44	.40	.34	.28	.28	.27	.26	.24	.23	.12	.02	

-2	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	THRIE	G4S	D	C	E	G3	B	G4W	G1	
VALUES	52.81	65.67	66.28	66.51	70.36	72.25	75.86	76.17	86.96	87.14	230.13	
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3	
VALUES	456.29	484.14	508.60	540.73	654.34	655.44	663.84	684.99	705.62	784.76	1394.65	
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G3	G1		
VALUES	.46	.41	.35	.28	.28	.28	.26	.24	.24	.12	.03	

A.175

-4	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	THRIE	G4S	D	C	E	G3	B	G4W	G1	
VALUES	47.68	61.79	62.24	63.23	67.23	68.15	71.54	73.54	82.88	83.06	228.04	
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3	
VALUES	451.16	480.26	506.51	536.63	651.36	652.01	661.21	681.70	701.54	780.72	1390.02	
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G3	G1		
VALUES	.47	.42	.36	.29	.28	.28	.27	.25	.24	.13	.03	

-6	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	THRIE	G4S	D	C	E	G3	B	G4W	G1	
VALUES	43.11	57.95	58.23	59.21	64.12	64.80	66.90	71.01	78.79	78.96	225.70	
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3	
VALUES	446.59	476.43	504.17	532.59	647.26	649.49	658.28	678.19	697.43	776.71	1385.38	
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G3	G1		
VALUES	.48	.43	.37	.29	.29	.29	.28	.26	.25	.13	.04	

-8	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	THRIE	G4S	D	C	E	G3	B	G4W	G1	
VALUES	39.79	54.59	54.69	56.20	60.55	61.70	62.70	68.31	75.01	75.18	223.06	
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3	
VALUES	443.27	473.06	501.54	529.03	643.49	646.78	655.17	674.68	693.65	773.17	1381.18	
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G3	G1		
VALUES	.49	.44	.38	.30	.29	.29	.29	.26	.25	.13	.05	

4R-7-4

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 7-FT SHOULDER

4R-7-6

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 13 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 207.18

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	C	G3	R	G4W	G1
VALUES	40.62	75.01	76.05	78.22	80.96	83.43	88.12	95.01	97.47	97.66	169.88
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	444.10	448.36	501.90	556.60	656.69	665.94	669.53	693.48	716.13	799.44	1413.49
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1	G3
VALUES	.41	.30	.25	.22	.22	.21	.19	.18	.18	.13	.09
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	C	G3	B	G4W	G1
VALUES	39.72	73.70	75.04	76.76	78.96	81.76	85.73	92.90	95.31	95.50	168.14
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	443.20	446.62	500.23	554.21	655.23	663.79	668.52	692.18	713.98	797.93	1411.38
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1	G3
VALUES	.42	.30	.26	.23	.22	.22	.20	.18	.18	.14	.09
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	C	G3	B	G4W	G1
VALUES	38.81	72.23	73.93	75.31	76.67	79.81	83.15	90.46	93.00	93.19	166.09
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	442.28	444.56	498.28	551.63	653.78	661.48	667.41	690.71	711.67	795.15	1408.44
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1	G3
VALUES	.42	.30	.26	.23	.22	.22	.20	.18	.18	.15	.09
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	C	G3	B	G4W	G1
VALUES	37.83	70.54	72.66	73.83	74.07	77.47	80.34	87.63	90.50	90.68	163.66
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	441.31	442.14	495.95	548.82	652.30	658.97	666.14	689.02	709.16	792.55	1406.10
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1	G3
VALUES	.42	.31	.27	.23	.23	.22	.21	.19	.19	.16	.09
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	C	G3	R	G4W	G1
VALUES	36.78	68.57	71.14	71.14	72.27	74.67	77.27	84.32	87.77	87.95	160.80
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	439.27	440.26	493.15	545.74	650.74	656.24	664.66	687.04	706.43	789.61	1402.80
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1	G3
VALUES	.42	.32	.28	.23	.23	.22	.21	.19	.19	.17	.09

A.176

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 7-FT SHOULDER

PAVEMENT-10-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-10-OBSTACLE DISTANCE = 6 FT

PAVEMENT-10-OBSTACLE DISTANCE = 13 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 207.18

AAOT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	D	E	A	C	G3	H	G4W	G1
VALUES	35.61	66.25	67.87	69.46	70.57	71.33	73.92	80.50	84.81	84.99	157.42
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	435.90	439.09	489.81	542.40	649.05	653.28	662.93	684.23	703.46	786.35	1398.98
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1	G3
VALUES	.43	.32	.28	.24	.23	.23	.22	.20	.19	.18	.10

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	D	A	E	C	G3	B	G4W	G1
VALUES	34.31	63.58	64.33	67.43	67.45	68.67	70.34	76.19	81.64	81.82	153.48
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	431.46	437.78	485.93	538.81	647.15	650.11	660.40	682.05	700.29	782.81	1394.67
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1	G3
VALUES	.43	.33	.29	.24	.24	.23	.22	.20	.20	.19	.10

A.177

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	E	C	G3	B	G4W	G1
VALUES	32.84	60.56	60.69	63.18	65.08	66.52	66.65	71.55	78.38	78.55	148.97
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	427.44	436.32	481.65	535.13	644.99	646.85	658.55	679.04	697.03	779.17	1390.03
BENEFIT/COST	G2	A	C	E	D	G4S	B	G1	G4W	THRIE	G3
VALUES	.43	.34	.30	.24	.24	.24	.23	.21	.21	.20	.10

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	D	C	E	G3	B	G4W	G1
VALUES	31.23	57.22	57.34	58.85	62.44	63.15	64.04	66.90	75.24	75.41	143.92
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	422.40	434.71	477.33	531.63	642.57	643.72	655.92	675.82	693.89	775.70	1385.38
BENEFIT/COST	G2	A	C	E	D	G4S	B	G1	G4W	THRIE	G3
VALUES	.44	.35	.31	.25	.24	.24	.23	.23	.21	.21	.11

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	C	E	G3	B	G4W	G1
VALUES	29.59	54.15	54.23	54.99	59.67	60.11	61.50	62.70	72.46	72.63	138.40
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	416.87	433.07	473.47	528.59	639.97	640.93	653.14	672.63	691.10	772.71	1381.18
BENEFIT/COST	G2	A	C	E	D	G4S	B	G1	G4W	THRIE	G3
VALUES	.44	.36	.31	.25	.25	.25	.25	.24	.22	.21	.11

4R-7-6

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 7-FT SHOULDER

4R-7-8

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 15 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 181.36

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10- STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	G1	C	G3	B	G4W
VALUES	34.57	72.71	73.68	75.02	80.96	82.32	83.01	89.17	89.52	96.38	96.57
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	361.48	438.05	500.80	557.65	653.50	664.86	667.15	691.19	715.05	799.44	1408.00
BENEFIT/COST	G2	G1	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.36	.35	.24	.20	.18	.18	.14	.15	.14	.14	.07

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	G1	A	C	G3	B	G4W
VALUES	33.49	71.37	72.63	73.72	78.96	79.59	80.86	86.58	87.64	94.43	94.62
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	358.07	437.46	499.33	555.06	652.20	662.91	664.11	689.85	713.10	797.43	1406.12
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.37	.37	.24	.20	.19	.18	.18	.15	.14	.14	.07

A.178

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	G1	THRIE	A	C	G3	B	G4W
VALUES	33.41	69.87	71.48	72.44	75.92	76.67	79.11	83.81	85.47	92.32	92.51
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	354.40	436.88	497.59	552.28	650.92	660.79	664.96	688.35	710.98	795.15	1401.94
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.38	.37	.24	.21	.19	.19	.18	.16	.15	.14	.07

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	G1	THRIE	A	C	G3	B	G4W
VALUES	32.80	68.18	70.22	71.16	71.93	74.07	76.98	80.81	82.92	90.01	90.19
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	350.40	436.28	495.45	549.29	649.63	658.48	663.69	686.66	708.67	792.55	1401.40
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.39	.37	.25	.21	.19	.19	.18	.16	.15	.15	.07

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	G1	D	E	THRIE	A	C	G3	B	G4W
VALUES	32.14	66.27	67.53	68.81	69.83	71.14	74.35	77.57	79.94	87.45	87.64
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	346.01	435.62	492.82	546.05	648.30	655.43	662.29	684.75	706.11	789.61	1398.42
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.41	.37	.26	.22	.19	.19	.19	.17	.15	.15	.08

4-LANE RURAL ROAD WITH 7-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

	PAVEMENT-TO-OBSTACLE DISTANCE =	15 FT	SOCIETAL COST WITH NO GUARDRAIL = \$	181.36
0.00	0.00	0.00	0.00	0.00
0.25	0.25	0.25	0.25	0.25
0.50	0.50	0.50	0.50	0.50
0.75	0.75	0.75	0.75	0.75
1.00	1.00	1.00	1.00	1.00
1.25	1.25	1.25	1.25	1.25
1.50	1.50	1.50	1.50	1.50
1.75	1.75	1.75	1.75	1.75
2.00	2.00	2.00	2.00	2.00
2.25	2.25	2.25	2.25	2.25
2.50	2.50	2.50	2.50	2.50
2.75	2.75	2.75	2.75	2.75
3.00	3.00	3.00	3.00	3.00
3.25	3.25	3.25	3.25	3.25
3.50	3.50	3.50	3.50	3.50
3.75	3.75	3.75	3.75	3.75
4.00	4.00	4.00	4.00	4.00
4.25	4.25	4.25	4.25	4.25
4.50	4.50	4.50	4.50	4.50
4.75	4.75	4.75	4.75	4.75
5.00	5.00	5.00	5.00	5.00
5.25	5.25	5.25	5.25	5.25
5.50	5.50	5.50	5.50	5.50
5.75	5.75	5.75	5.75	5.75
6.00	6.00	6.00	6.00	6.00
6.25	6.25	6.25	6.25	6.25
6.50	6.50	6.50	6.50	6.50
6.75	6.75	6.75	6.75	6.75
7.00	7.00	7.00	7.00	7.00
7.25	7.25	7.25	7.25	7.25
7.50	7.50	7.50	7.50	7.50
7.75	7.75	7.75	7.75	7.75
8.00	8.00	8.00	8.00	8.00
8.25	8.25	8.25	8.25	8.25
8.50	8.50	8.50	8.50	8.50
8.75	8.75	8.75	8.75	8.75
9.00	9.00	9.00	9.00	9.00
9.25	9.25	9.25	9.25	9.25
9.50	9.50	9.50	9.50	9.50
9.75	9.75	9.75	9.75	9.75
10.00	10.00	10.00	10.00	10.00

AADT = 1000	GUARDRAIL LENGTH = 100 FT	OBSTACLE LENGTH = 100 FT
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PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE
VALUES	278.48	403.48	418.48	458.48	568.48	578.48	593.48	618.48	618.48	718.48
SOCIAL COST	G2	G1	G4S	D	THRIE	E	A	C	G3	B
VALUES	31.40	62.71	64.12	67.25	67.87	68.41	71.15	74.09	76.48	84.63
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE
VALUES	341.19	434.87	489.63	525.73	636.35	646.89	660.72	682.50	703.29	786.35
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W
VALUES	.43	.37	.26	.23	.20	.19	.19	.17	.16	.08
-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE
VALUES	278.48	403.48	418.48	458.48	568.48	578.48	593.48	618.48	618.48	718.48
SOCIAL COST	G2	G1	G4S	D	THRIE	E	A	C	G3	B
VALUES	30.54	61.72	64.93	65.51	66.87	67.37	70.41	72.58	81.56	81.74
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE
VALUES	336.03	434.01	485.85	538.89	645.35	650.04	658.98	680.20	700.21	782.81
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W
VALUES	.44	.37	.27	.24	.20	.20	.19	.18	.16	.08
-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE
VALUES	278.48	403.48	418.48	458.48	568.48	578.48	593.48	618.48	618.48	718.48
SOCIAL COST	G2	G1	G4S	D	THRIE	E	A	C	G3	B
VALUES	29.54	52.38	54.12	60.69	63.15	63.58	65.15	66.68	68.37	78.35
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE
VALUES	330.85	433.02	481.63	535.15	643.63	646.83	657.06	672.60	697.00	779.17
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W
VALUES	.46	.38	.28	.24	.20	.20	.20	.18	.17	.09
-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE
VALUES	278.48	403.48	418.48	458.48	568.48	578.48	593.48	618.48	618.48	718.48
SOCIAL COST	G2	G1	G4S	D	THRIE	E	A	C	G3	B
VALUES	28.43	47.76	56.41	57.22	58.85	61.48	63.15	63.22	64.20	75.24
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE
VALUES	326.24	431.91	477.32	531.63	641.70	643.71	654.95	674.88	693.88	775.70
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W
VALUES	.48	.38	.29	.25	.20	.20	.20	.19	.17	.09
-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE
VALUES	278.48	403.48	418.48	458.48	568.48	578.48	593.48	618.48	618.48	718.48
SOCIAL COST	G2	G1	G4S	D	THRIE	E	A	C	G3	B
VALUES	27.31	44.39	53.73	54.23	54.99	59.23	60.11	60.50	61.10	72.46
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE
VALUES	322.87	430.79	473.47	528.59	639.58	640.93	652.70	672.20	691.10	772.71
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W
VALUES	.49	.38	.30	.26	.21	.21	.21	.19	.18	.09

A.179

4R-7-8

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 7-FT SHOULDER

4R-7-10

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 17 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 159.32

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1	2	3	4	5	6	7	8	9	10	11
10	STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE
	VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	618.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	G4W
	VALUES	32.07	51.05	71.61	72.55	75.02	80.96	82.32	89.17	96.57
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE
	VALUES	329.52	435.55	500.80	557.65	653.50	664.86	666.03	715.05	1408.00
	BENEFIT/COST	G1	G2	A	C	D	E	G4S	THRIE	G4W
	VALUES	.39	.32	.18	.15	.15	.15	.14	.11	.10
8	STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE
	VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	618.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	G4W
	VALUES	31.45	49.40	70.47	71.71	73.72	78.96	80.86	86.58	94.62
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE
	VALUES	327.88	434.42	499.33	555.06	652.20	662.91	665.19	713.10	1406.12
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	G4W
	VALUES	.39	.32	.19	.16	.15	.15	.14	.11	.10
6	STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE
	VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	618.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	G4W
	VALUES	30.83	47.81	69.18	70.78	72.44	76.67	79.11	83.81	92.32
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE
	VALUES	326.39	434.31	497.59	552.28	650.92	660.79	664.25	710.98	1403.94
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	G4W
	VALUES	.40	.32	.19	.16	.15	.15	.15	.12	.11
4	STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE
	VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	618.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	G4W
	VALUES	30.23	46.54	67.68	69.71	71.16	74.07	76.98	80.81	90.19
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE
	VALUES	325.02	433.70	495.45	549.29	649.63	658.48	663.19	708.67	1401.40
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	G4W
	VALUES	.41	.32	.20	.17	.15	.15	.15	.12	.11
2	STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE
	VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	618.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	G4W
	VALUES	29.64	45.26	65.95	68.48	69.83	71.14	74.35	77.57	87.45
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE
	VALUES	323.73	433.12	492.82	546.05	648.30	655.93	661.36	706.11	1398.61
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	G4W
	VALUES	.41	.32	.20	.17	.15	.15	.15	.12	.12

A.180

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 7-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 17 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 159.32

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11	
0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	C	G3	B	G4W
	VALUES	29.07	44.01	63.94	67.06	62.87	68.41	71.15	74.09	76.48	84.63	84.81
	TOTAL COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
	VALUES	322.49	432.55	489.63	542.57	646.89	653.10	660.54	682.42	703.29	786.35	1394.96
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
	VALUES	.41	.32	.21	.18	.16	.16	.15	.13	.12	.12	.06

-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	D	E	A	C	G3	B	G4W
	VALUES	28.52	42.74	61.64	64.33	65.43	66.87	67.37	70.41	72.58	81.56	81.74
	TOTAL COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
	VALUES	321.22	431.99	485.85	538.89	645.35	650.04	658.90	680.12	700.21	782.81	1391.05
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
	VALUES	.42	.32	.22	.19	.16	.16	.16	.14	.13	.13	.07

A.181

-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	C	G3	B	G4W
	VALUES	27.97	41.40	59.10	60.69	63.15	63.56	65.15	66.68	68.37	78.35	78.53
	TOTAL COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
	VALUES	319.88	431.45	481.63	535.15	643.63	646.83	657.04	677.57	697.00	779.17	1386.84
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
	VALUES	.42	.33	.23	.20	.16	.16	.16	.14	.14	.13	.07

-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	A	D	C	E	G3	B	G4W
	VALUES	27.42	39.96	56.40	57.22	58.85	61.47	63.15	63.22	64.20	75.24	75.41
	TOTAL COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
	VALUES	318.43	430.89	477.32	531.63	641.70	643.71	654.95	674.88	693.88	775.20	1382.67
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
	VALUES	.43	.33	.24	.21	.17	.17	.16	.15	.14	.14	.07

-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	C	G3	B	G4W
	VALUES	26.85	38.49	53.73	54.23	54.99	59.23	60.11	60.50	61.10	72.46	72.63
	TOTAL COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
	VALUES	316.97	430.33	473.47	528.59	639.58	640.93	652.70	672.20	691.10	772.71	1378.98
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
	VALUES	.43	.33	.25	.21	.17	.17	.17	.15	.15	.14	.07

4R-7-10

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 7-FT SHOULDER

4R-7-12

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 19 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 140.56

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	G3	C	B	G4W
VALUES	32.07	41.92	71.61	72.55	75.02	80.46	82.32	87.11	89.17	96.38	96.57
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	320.40	435.55	500.80	557.65	653.50	664.86	666.03	690.08	715.05	799.44	1405.58
BENEFIT/COST	G1	G2	A	D	E	G4S	C	THRIE	B	G4W	G3
VALUES	.35	.27	.14	.11	.11	.11	.11	.08	.08	.07	.04
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	G3	C	B	G4W
VALUES	31.45	41.26	70.47	71.71	73.72	78.96	80.86	85.19	86.58	94.43	94.62
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	319.73	434.92	499.33	555.06	652.20	662.91	665.19	688.95	713.10	797.43	1403.66
BENEFIT/COST	G1	G2	A	D	E	C	G4S	THRIE	B	G4W	G3
VALUES	.36	.27	.14	.12	.12	.12	.11	.09	.08	.07	.04
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	G3	C	B	G4W
VALUES	30.83	40.55	69.18	70.78	72.44	76.67	79.11	82.98	83.81	92.32	92.51
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	319.02	434.31	497.59	552.28	650.92	660.79	664.25	687.65	710.98	795.15	1401.45
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.36	.27	.15	.12	.12	.12	.12	.09	.08	.08	.04
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	G3	C	B	G4W
VALUES	30.23	39.76	67.68	69.71	71.16	74.07	76.98	80.44	80.81	90.01	90.19
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	318.24	433.70	495.45	549.29	649.63	658.48	663.19	686.16	708.67	792.55	1398.91
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.36	.27	.15	.13	.12	.12	.12	.09	.09	.08	.05
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	G3	C	B	G4W
VALUES	29.64	38.87	65.95	68.48	69.83	71.14	74.35	77.52	77.57	87.45	87.64
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	317.35	433.12	492.82	546.05	648.30	655.93	661.96	684.42	706.11	789.61	1396.00
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.37	.27	.16	.13	.12	.12	.12	.10	.09	.09	.05

A.182

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 7-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 19 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 140.56

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

0 STATE COST
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 618.48 1318.48
 SOCIETAL COST
 VALUES 29.07 37.85 63.94 67.06 67.87 68.41 71.15 74.09 74.24 84.63 84.81
 TOTAL COST
 VALUES 316.33 432.55 489.63 542.57 646.89 653.10 660.54 682.42 703.29 786.35 1392.71
 BENEFIT/COST
 VALUES .37 .28 .17 .14 .12 .12 .12 .10 .10 .09 .05

-2 STATE COST
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 618.48 1318.48
 SOCIETAL COST
 VALUES 28.52 36.69 61.64 64.33 65.43 66.87 67.37 70.41 70.62 81.56 81.74
 TOTAL COST
 VALUES 315.16 431.99 485.85 538.89 645.35 650.04 658.90 680.12 700.21 782.81 1389.10
 BENEFIT/COST
 VALUES .37 .28 .17 .15 .13 .13 .13 .11 .10 .10 .05

A.183

-4 STATE COST
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 618.48 1318.48
 SOCIETAL COST
 VALUES 27.97 35.35 59.10 60.69 63.15 63.56 65.15 66.68 66.85 78.35 78.53
 TOTAL COST
 VALUES 319.82 431.45 481.63 535.15 643.63 646.83 657.04 677.57 697.00 779.17 1385.32
 BENEFIT/COST
 VALUES .38 .28 .18 .16 .13 .13 .13 .11 .11 .10 .06

-6 STATE COST
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 618.48 1318.48
 SOCIETAL COST
 VALUES 27.42 33.85 56.40 57.22 58.85 61.47 63.15 63.22 63.22 75.41 75.41
 TOTAL COST
 VALUES 312.33 430.89 477.32 531.63 641.70 643.71 654.95 674.88 693.88 775.70 1381.69
 BENEFIT/COST
 VALUES .38 .28 .20 .17 .14 .14 .13 .12 .11 .11 .06

-8 STATE COST
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 618.48 1318.48
 SOCIETAL COST
 VALUES 26.85 32.31 53.73 54.23 54.99 59.23 60.05 60.11 61.10 72.46 72.63
 TOTAL COST
 VALUES 310.28 430.33 473.47 528.59 639.58 640.93 652.70 672.20 691.10 772.71 1378.53
 BENEFIT/COST
 VALUES .39 .28 .20 .17 .14 .14 .14 .12 .12 .11 .06

4R-7-12

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 8 FT

4R-8-0

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 8 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 108.39

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	E	THRIE	A	G2	C	G3	B	G4W	G1
VALUES	72.57	73.17	76.28	78.39	78.46	78.67	89.13	91.69	97.43	97.61	174.49
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	452.46	482.15	496.94	557.60	655.25	665.91	666.65	691.04	716.09	796.87	1410.17
BENEFIT/COST	G2	A	D	G4S	E	THRIE	C	B	G4W	G3	G1
VALUES	.07	.07	.07	.05	.05	.04	.04	.02	.01	.01	-.24
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	E	THRIE	A	G2	C	G3	B	G4W	G1
VALUES	71.38	72.23	75.16	75.31	76.73	76.98	86.86	89.94	95.38	95.56	172.40
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	450.87	478.79	495.45	555.33	653.63	663.86	665.71	689.86	714.04	795.20	1408.42
BENEFIT/COST	G2	A	D	G4S	E	C	THRIE	B	G4W	G3	G1
VALUES	.08	.07	.06	.06	.05	.04	.04	.02	.02	.01	-.24
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	E	THRIE	A	G2	C	G3	B	G4W	G1
VALUES	70.10	71.25	71.74	73.59	74.81	75.28	84.44	87.93	93.21	93.39	170.12
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	448.60	475.22	493.76	552.92	652.07	661.69	664.72	688.58	711.87	793.29	1406.41
BENEFIT/COST	G2	A	D	G4S	E	C	THRIE	B	G4W	G3	G1
VALUES	.09	.07	.06	.06	.06	.05	.04	.02	.02	.01	-.23
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	E	THRIE	A	G2	C	G3	B	G4W	G1
VALUES	67.89	68.65	70.15	72.05	72.61	73.29	81.82	85.58	90.87	91.05	167.61
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	446.09	471.36	491.77	550.30	650.52	659.34	663.63	687.13	709.52	791.08	1404.05
BENEFIT/COST	G2	A	D	G4S	E	C	THRIE	B	G4W	G3	G1
VALUES	.10	.08	.06	.06	.06	.05	.05	.03	.02	.02	-.22
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	E	THRIE	A	G2	C	G3	B	G4W	G1
VALUES	63.66	65.95	68.89	70.08	70.47	70.92	78.91	82.28	88.28	88.45	164.81
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	443.28	467.14	489.40	547.39	648.94	656.75	662.37	685.43	706.93	788.55	1401.26
BENEFIT/COST	G2	A	D	G4S	E	C	THRIE	B	G4W	G3	G1
VALUES	.11	.08	.06	.06	.06	.05	.05	.03	.03	.02	-.21

A.184

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 8 FT

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 8 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 106.39

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	D	A	E	C	G3	B	G4W	G1
VALUES	59.99	64.94	67.20	67.40	68.10	68.80	75.64	79.45	85.37	85.54	161.64
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	440.12	462.47	486.57	544.12	647.28	653.85	660.88	683.42	704.02	785.67	1397.93
BENEFIT/COST	G2	A	G4S	D	C	E	THRIE	B	G4W	G3	G1
VALUES	.12	.09	.07	.07	.07	.06	.05	.04	.03	.02	-.20
-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	E	C	G3	B	G4W	G1
VALUES	53.86	62.56	63.97	64.78	65.63	67.00	71.97	75.55	82.11	82.28	158.03
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	436.51	457.34	483.25	540.44	645.47	650.54	659.11	681.04	700.76	782.44	1394.03
BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
VALUES	.13	.10	.07	.07	.07	.07	.06	.04	.04	.02	-.14
-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	E	C	G3	B	G4W	G1
VALUES	48.44	54.80	60.48	61.03	63.55	64.94	67.94	71.14	78.53	79.70	153.94
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	432.42	451.91	479.51	536.42	643.47	647.01	657.03	678.28	697.18	778.95	1384.61
BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
VALUES	.14	.11	.08	.08	.07	.07	.06	.05	.04	.03	-.17
-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	D	E	C	G3	B	G4W	G1
VALUES	43.20	56.76	56.96	57.12	61.18	62.76	63.81	66.49	74.84	75.01	149.38
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	427.86	445.68	475.60	532.24	641.24	643.32	654.65	675.23	693.48	775.44	1384.96
BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
VALUES	.16	.12	.09	.08	.08	.08	.07	.06	.05	.03	-.15
-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	G4S	THRIE	D	C	E	G3	B	G4W	G1
VALUES	39.01	53.54	53.69	53.80	58.64	60.05	60.39	62.13	71.42	71.59	144.41
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	422.89	442.48	472.02	528.52	638.87	639.90	652.11	672.17	690.06	772.27	1380.60
BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
VALUES	.17	.13	.10	.09	.08	.08	.07	.06	.06	.03	-.14

A.185

4R-8-0

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 2-FT SHOULDER

4R-8-2

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 10 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 254.24
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

10 STATE COST
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST
 VALUES 93.61 122.55 123.42 123.83 156.78 166.01 166.62 182.99 183.17 192.82 262.95
 TOTAL COST
 VALUES 541.42 575.26 592.30 596.30 716.03 745.09 751.46 784.48 801.64 812.09 1441.90
 BENEFIT/COST
 VALUES .28 .23 .22 .22 .15 .15 .14 .13 .11 .10 -.03

8 STATE COST
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST
 VALUES 90.78 118.87 119.39 119.57 154.14 162.71 163.58 179.53 179.71 188.93 262.96
 TOTAL COST
 VALUES 541.43 572.61 587.86 592.40 712.34 742.06 748.00 781.19 798.18 809.25 1438.05
 BENEFIT/COST
 VALUES .29 .24 .23 .23 .16 .16 .15 .13 .12 .10 -.03

6 STATE COST
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST
 VALUES 87.84 114.63 114.88 115.30 150.96 158.97 160.16 175.53 175.71 184.43 262.97
 TOTAL COST
 VALUES 541.45 569.43 583.11 587.90 708.36 738.64 744.01 777.45 794.19 806.31 1433.78
 BENEFIT/COST
 VALUES .30 .25 .23 .23 .17 .16 .15 .14 .13 .11 -.03

4 STATE COST
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST
 VALUES 84.23 109.47 110.51 110.52 142.11 154.66 156.25 170.88 171.06 179.18 262.99
 TOTAL COST
 VALUES 541.46 565.54 577.95 582.66 704.00 734.72 739.35 773.14 789.53 803.21 1428.99
 BENEFIT/COST
 VALUES .31 .26 .24 .24 .19 .17 .16 .15 .13 .11 -.03

2 STATE COST
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST
 VALUES 81.40 103.81 105.08 105.69 142.46 149.65 151.72 165.43 165.60 173.04 263.01
 TOTAL COST
 VALUES 541.48 560.93 572.29 576.52 699.17 730.20 733.90 768.12 784.08 799.88 1423.56
 BENEFIT/COST
 VALUES .32 .27 .25 .24 .20 .18 .17 .16 .14 .11 -.03

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 8-FT SHOULDER

4R-8-2

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 10 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 254.24

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	B	G4W	G2	G1
VALUES	77.78	97.56	98.92	100.30	136.86	143.79	146.46	159.05	159.22	165.85	263.03
TOTAL COST	G1	A	C	G2	D	E	B	G4S	G4W	THRIE	G3
VALUES	541.51	555.34	566.03	569.32	693.77	724.93	727.52	762.27	777.70	796.26	1412.40
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1
VALUES	.33	.28	.26	.25	.22	.19	.18	.17	.15	.12	-.03
-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	B	G4W	G2	G1
VALUES	73.83	90.69	92.01	94.33	130.25	137.02	140.39	151.68	151.85	157.54	263.07
TOTAL COST	G1	A	C	G2	D	E	B	G4S	G4W	THRIE	G3
VALUES	541.54	548.73	552.17	561.01	687.81	718.86	720.16	755.50	770.33	792.30	1410.44
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1
VALUES	.35	.30	.27	.25	.24	.20	.19	.18	.17	.12	-.03
-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	B	G4W	G2	G1
VALUES	69.59	83.43	84.57	87.96	122.75	129.43	133.56	143.47	143.64	148.26	263.10
TOTAL COST	A	G1	G2	C	D	B	E	G4S	G4W	THRIE	G3
VALUES	541.23	541.58	551.73	551.90	681.43	711.95	712.03	747.91	762.12	788.06	1403.05
BENEFIT/COST	C	A	D	G2	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.36	.31	.28	.26	.24	.21	.20	.19	.18	.13	-.03
-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	B	G4W	G2	G1
VALUES	65.29	76.37	77.26	81.67	114.80	121.42	126.27	134.94	135.10	138.55	263.14
TOTAL COST	A	G1	G2	C	D	B	E	G4S	G4W	THRIE	G3
VALUES	533.28	541.62	542.03	544.85	675.14	703.41	704.75	739.90	753.58	783.77	1395.73
BENEFIT/COST	C	A	D	G2	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.38	.33	.29	.29	.26	.22	.21	.21	.19	.13	-.03
-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	B	G4W	G2	G1
VALUES	61.37	70.54	71.13	76.31	107.20	113.71	119.09	126.94	127.10	129.37	263.17
TOTAL COST	A	G2	C	G1	D	B	E	G4S	G4W	THRIE	G3
VALUES	525.67	532.85	535.01	541.65	669.29	695.41	697.56	732.19	745.58	779.85	1389.60
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.39	.35	.31	.30	.27	.23	.23	.22	.21	.14	-.03

A.187

4R-8-4

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 8-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 221.67
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	A	G2	THRIE	C	E	G3	B	G4W	G1
VALUES	76.80	77.40	78.46	78.67	79.87	84.13	84.97	91.69	102.31	102.49	228.00
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	482.15	446.94	506.48	557.60	668.45	670.78	670.87	695.28	720.46	798.35	1410.17
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3	G1
VALUES	.35	.34	.28	.24	.23	.23	.21	.20	.19	.10	-.02
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	A	THRIE	C	E	G3	B	G4W	G1
VALUES	75.31	75.47	76.31	76.98	78.38	86.86	87.03	89.44	100.11	100.29	227.04
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	478.79	495.45	505.52	555.33	665.50	668.58	669.79	693.94	718.76	796.85	1408.42
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3	G1
VALUES	.36	.35	.29	.24	.24	.23	.21	.20	.20	.10	-.02
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	A	THRIE	E	C	G3	B	G4W	G1
VALUES	71.74	74.00	75.14	75.28	76.65	84.25	84.44	87.93	97.76	97.94	226.01
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	475.22	493.76	504.48	552.92	662.72	666.24	668.62	692.48	716.42	795.13	1406.41
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3	G1
VALUES	.37	.35	.24	.25	.24	.24	.22	.20	.20	.10	-.02
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	D	THRIE	E	C	G3	B	G4W	G1
VALUES	67.89	72.34	73.24	73.84	74.62	81.63	81.82	85.58	95.22	95.39	224.88
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	471.36	491.77	503.35	550.30	660.10	663.69	667.32	690.82	713.87	793.10	1404.05
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G3	G1
VALUES	.38	.35	.30	.25	.24	.24	.22	.20	.20	.10	-.01
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	THRIE	D	C	E	G3	B	G4W	G1
VALUES	63.66	70.41	70.92	72.20	72.35	78.91	79.14	82.78	92.38	92.56	223.64
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	467.14	489.40	502.12	547.39	657.62	660.86	665.93	688.89	711.04	790.67	1401.26
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G3	G1
VALUES	.39	.36	.30	.25	.25	.24	.23	.21	.21	.11	-.01

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 8-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 221.67
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	G4S	THRIE	D	C	E	G3	B	G4W	G1
VALUES	58.99	68.10	68.16	69.30	70.62	75.64	76.76	79.45	89.19	89.37	222.28
TOTAL COST	G2	A	G1	C	B	D	D	G4S	G4W	THRIE	G3
VALUES	462.47	486.57	500.75	544.12	655.23	657.67	664.09	686.63	707.84	787.77	1392.93
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G3	G1
VALUES	.40	.37	.31	.25	.25	.25	.23	.21	.21	.11	.00
-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	G4S	THRIE	D	C	E	G3	B	G4W	G1
VALUES	53.86	64.78	65.52	65.89	68.59	71.97	74.42	75.55	85.60	85.77	220.76
TOTAL COST	G2	A	G1	C	B	D	D	G4S	G4W	THRIE	G3
VALUES	457.34	483.25	499.24	540.44	652.89	654.07	662.07	684.00	704.25	784.37	1394.03
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G3	G1
VALUES	.42	.37	.32	.26	.25	.25	.24	.22	.22	.11	.00
-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	THRIE	G4S	D	C	G3	E	B	G4W	G1
VALUES	48.44	61.03	62.04	62.50	66.24	67.94	71.14	72.06	81.64	81.80	219.07
TOTAL COST	G2	A	G1	C	B	D	D	G4S	G4W	THRIE	G3
VALUES	451.91	479.51	497.54	536.42	650.11	650.53	659.72	680.47	700.28	780.51	1389.61
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G3	G1
VALUES	.43	.38	.33	.26	.26	.26	.25	.23	.22	.11	.01
-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	THRIE	G4S	D	C	G3	E	B	G4W	G1
VALUES	43.20	57.12	58.00	59.18	63.58	63.81	66.49	69.61	77.51	77.67	217.15
TOTAL COST	G2	A	G1	C	B	D	D	G4S	G4W	THRIE	G3
VALUES	446.68	475.60	495.63	532.29	645.98	648.08	657.05	677.65	696.15	776.48	1384.96
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G3	G1
VALUES	.44	.39	.34	.27	.26	.26	.25	.23	.23	.12	.02
-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	THRIE	G4S	D	C	G3	E	B	G4W	G1
VALUES	39.01	53.54	54.29	55.80	60.05	60.73	62.13	67.07	73.62	73.78	214.96
TOTAL COST	G2	A	G1	C	B	D	D	G4S	G4W	THRIE	G3
VALUES	442.48	472.02	493.44	528.52	642.09	645.55	654.20	674.28	692.26	772.77	1380.60
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G3	G1
VALUES	.45	.40	.35	.27	.27	.27	.26	.24	.23	.12	.02

A.189

4R-8-4

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 8-FT SHOULDER

4R-8-6

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 193.76
 ADOT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

10	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	C	G3	G3	B	G4W	G1
VALUES	39.48	72.57	73.17	76.78	78.39	80.67	86.76	92.05	92.05	95.14	95.33	161.25
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4S	G4W	THRIE	G3
VALUES	439.73	442.95	449.14	555.23	655.25	663.62	666.65	691.04	713.80	713.80	796.87	1410.53
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	THRIE	G4W	G1	G3
VALUES	.38	.27	.23	.20	.20	.20	.17	.16	.16	.16	.12	.08

8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	C	G3	G3	B	G4W	G1
VALUES	38.49	71.38	72.23	75.16	76.73	79.17	84.50	90.23	90.23	93.10	93.28	159.93
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4S	G4W	THRIE	G3
VALUES	438.41	441.96	447.65	552.97	653.63	661.58	665.71	689.86	711.76	711.76	795.20	1408.71
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	THRIE	G4W	G1	G3
VALUES	.38	.27	.23	.21	.20	.20	.18	.16	.16	.16	.12	.08

A.190

6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	C	G3	G3	B	G4W	G1
VALUES	37.51	70.10	71.25	73.59	74.81	77.49	82.07	88.16	88.16	90.93	91.11	158.36
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4S	G4W	THRIE	G3
VALUES	436.84	440.99	445.96	550.55	652.07	659.40	664.72	688.58	709.58	709.58	793.29	1406.64
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	THRIE	G4W	G1	G3
VALUES	.39	.28	.24	.21	.21	.20	.18	.17	.17	.17	.13	.08

4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	C	G3	G3	B	G4W	G1
VALUES	36.51	68.65	70.15	72.05	72.61	75.49	79.46	85.74	85.74	88.59	88.76	156.49
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4S	G4W	THRIE	G3
VALUES	434.96	439.99	443.97	547.93	650.52	657.06	663.63	687.13	707.24	707.24	791.08	1404.22
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	THRIE	G4W	G1	G3
VALUES	.39	.28	.24	.21	.21	.20	.19	.17	.17	.17	.13	.08

2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	C	G3	G3	B	G4W	G1
VALUES	35.45	66.95	68.89	70.08	70.47	73.07	76.60	82.89	82.89	86.05	86.22	154.23
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4S	G4W	THRIE	G3
VALUES	432.71	438.93	441.55	545.08	648.94	654.52	662.37	685.43	704.70	704.70	788.55	1401.37
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	THRIE	G4W	G1	G3
VALUES	.39	.29	.25	.21	.21	.21	.19	.17	.17	.17	.14	.08

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 8-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 193.76
 ADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48 1318.48
	SOCIETAL COST	G2	G4S	THRIE	D	E	A	C	G3	B	G4W G1
	VALUES	34.31	64.94	67.20	67.40	68.80	70.11	73.47	79.52	83.28	83.45 151.53
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE G3
	VALUES	430.01	437.78	488.59	541.95	647.28	651.75	660.88	683.42	701.93	785.67 1397.99
	BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1 G3
	VALUES	.40	.30	.26	.22	.21	.21	.19	.18	.18	.15 .09
-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48 1318.48
	SOCIETAL COST	G2	G4S	THRIE	D	A	E	C	G3	B	G4W G1
	VALUES	33.04	62.56	63.97	65.63	66.55	67.00	70.06	75.58	80.27	80.44 148.31
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE G3
	VALUES	426.79	436.51	485.03	538.54	645.47	648.75	659.11	681.04	698.92	782.44 1394.06
	BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1 G3
	VALUES	.40	.30	.26	.22	.22	.21	.20	.18	.18	.16 .09
-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48 1318.48
	SOCIETAL COST	G2	G4S	THRIE	A	D	E	C	G3	R	G4W G1
	VALUES	31.62	59.80	60.48	62.44	63.55	64.99	66.43	71.15	77.08	77.25 144.53
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE G3
	VALUES	423.01	435.10	480.91	534.91	643.47	645.55	657.03	678.28	695.72	778.45 1384.62
	BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1 G3
	VALUES	.40	.31	.27	.22	.22	.22	.21	.19	.19	.18 .09
-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48 1318.48
	SOCIETAL COST	G2	G4S	THRIE	A	D	E	C	G3	B	G4W G1
	VALUES	30.07	56.76	56.96	58.05	61.18	62.76	62.81	66.99	73.88	74.04 140.21
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE G3
	VALUES	418.69	433.54	476.52	531.29	641.24	642.36	654.65	675.23	692.52	775.44 1384.96
	BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	G1	THRIE G3
	VALUES	.41	.32	.28	.23	.22	.22	.21	.19	.19	.19 .10
-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48 1318.48
	SOCIETAL COST	G2	G4S	THRIE	A	D	E	C	G3	R	G4W G1
	VALUES	28.47	53.69	53.80	53.98	58.64	59.58	60.39	62.13	70.97	71.14 135.43
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE G3
	VALUES	413.91	431.95	472.45	528.06	638.87	639.45	652.11	672.17	689.61	772.27 1380.60
	BENEFIT/COST	G2	A	C	E	D	G4S	B	G1	G4W	THRIE G3
	VALUES	.41	.33	.29	.23	.23	.23	.22	.21	.20	.19 .10

A.191

4R-8-6

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 8-FT SHOULDER

4R-8-8

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 169.90
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	G1	G3	C	B	G4W
VALUES	33.50	70.28	70.80	73.56	78.34	79.54	83.55	86.64	87.83	94.03	94.22
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	362.02	436.98	498.01	556.30	652.04	662.51	664.28	688.76	712.59	796.87	1405.12
BENEFIT/COST	G2	G1	A	C	D	E	G4S	B	THRIE	G4W	G3
VALUES	.34	.31	.22	.18	.17	.17	.16	.13	.13	.12	.06

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	G1	G3	C	B	G4W
VALUES	32.81	69.11	69.88	72.15	76.73	78.25	80.14	85.04	85.38	92.19	92.37
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	358.62	436.29	486.72	553.85	650.62	660.67	663.35	687.58	710.85	795.20	1403.52
BENEFIT/COST	G2	G1	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.34	.32	.22	.18	.17	.17	.16	.14	.13	.13	.06

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	G1	C	G3	B	G4W
VALUES	32.16	67.81	68.88	70.77	74.81	76.52	76.76	82.76	83.22	90.21	90.39
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	355.00	435.63	495.24	551.24	649.25	658.69	662.35	686.29	708.87	793.24	1401.69
BENEFIT/COST	G2	G1	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.34	.34	.22	.19	.17	.17	.17	.14	.13	.13	.07

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	G1	C	G3	B	G4W
VALUES	31.51	66.37	67.79	69.42	72.61	72.62	74.96	79.96	81.07	88.07	88.24
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	351.10	434.98	493.44	548.43	647.89	656.54	661.26	684.84	706.72	791.08	1399.55
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.35	.34	.23	.19	.17	.17	.17	.14	.14	.13	.07

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	G1	C	G3	B	G4W
VALUES	30.83	64.72	66.58	68.06	68.34	70.08	72.22	76.93	76.53	85.70	85.88
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	346.82	434.30	491.20	545.41	646.54	654.18	660.06	683.20	704.36	788.55	1397.00
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.36	.34	.23	.20	.18	.17	.17	.15	.14	.14	.07

A.192

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

	PAVEMENT-TO-OBSTACLE DISTANCE =	16 FT	SOCIETAL COST WITH NO GUARDRAIL = \$	169,90
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GAARDT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

A. 193

4R-8-8

4R-8-10

4-LANE RURAL ROAD WITH 8-FT SHOULDER

SUMMARY OF RESULTS

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 18 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 149.56
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10. STATE COST	G1	G2	A	C	B	E	D	G4S	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	G3	C	B	G4W
VALUES	31.01	51.93	69.15	69.65	73.56	78.39	79.54	86.64	87.83	94.03	94.22
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	330.40	434.49	498.01	556.30	652.04	662.51	663.13	687.63	712.69	796.87	1405.12
BENEFIT/COST	G1	G2	A	D	C	E	G4S	THRIE	B	G4W	G3
VALUES	.35	.29	.17	.13	.13	.13	.13	.10	.10	.09	.05
8. STATE COST	G1	G2	A	C	B	E	D	G4S	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	G3	C	B	G4W
VALUES	30.33	49.83	68.18	68.93	72.15	76.73	78.25	85.04	85.38	92.19	92.37
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	328.31	433.81	496.72	553.85	650.62	660.67	662.41	686.45	710.85	795.20	1403.52
BENEFIT/COST	G1	G2	A	C	D	E	G4S	THRIE	B	G4W	G3
VALUES	.36	.30	.17	.14	.14	.13	.13	.10	.10	.09	.05
6. STATE COST	G1	G2	A	C	B	E	D	G4S	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	G3	C	B	G4W
VALUES	29.66	47.91	67.09	68.14	70.77	74.81	76.76	82.76	83.22	90.21	90.34
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	326.39	433.14	495.24	551.24	649.25	658.69	661.62	685.57	708.87	793.29	1401.69
BENEFIT/COST	G1	G2	A	C	D	E	G4S	THRIE	B	G4W	G3
VALUES	.37	.30	.17	.14	.14	.14	.13	.10	.10	.10	.05
4. STATE COST	G1	G2	A	C	B	E	D	G4S	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	G3	C	B	G4W
VALUES	29.02	46.14	65.84	67.25	69.42	72.61	74.96	79.96	81.07	88.07	88.24
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	324.62	432.49	493.44	548.43	647.89	656.54	660.73	684.32	706.72	791.08	1399.55
BENEFIT/COST	G1	G2	A	C	D	E	G4S	THRIE	B	G4W	G3
VALUES	.37	.30	.18	.15	.14	.14	.14	.11	.11	.10	.05
2. STATE COST	G1	G2	A	C	B	E	D	G4S	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	G3	C	B	G4W
VALUES	28.40	44.51	64.38	66.23	68.06	70.08	72.72	76.93	78.53	85.70	85.88
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	322.98	431.87	491.20	545.41	646.54	654.18	659.70	682.85	704.36	788.55	1397.00
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.38	.30	.18	.16	.14	.14	.14	.11	.11	.10	.05

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 8-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 18 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 149,56

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE

1	2	3	4	5	6	7	8	9	10	11
PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
0	STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE
	VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	618.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	A	C	G3	G4W
	VALUES	27.80	42.97	62.65	65.03	66.67	67.20	73.66	75.49	83.26
	TOTAL COST	G1	G2	A	C	E	D	G4S	G4W	THRIE
	VALUES	321.44	431.20	488.39	542.14	645.14	651.56	681.13	701.73	785.67
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	G4W
	VALUES	.38	.30	.19	.16	.14	.14	.12	.11	.06
-2	STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	618.48	618.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	E	C	G3	G4W
	VALUES	27.24	41.47	60.63	63.64	63.97	65.20	70.15	71.44	80.18
	TOTAL COST	G1	G2	A	C	E	D	G4S	G4W	THRIE
	VALUES	319.45	430.71	484.94	538.62	643.68	648.66	679.11	698.83	782.44
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	G4W
	VALUES	.39	.30	.20	.17	.15	.14	.12	.11	.06
-4	STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	618.48	618.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	A	C	G3	G4W
	VALUES	26.70	39.98	58.32	60.48	62.01	62.41	66.46	67.92	77.05
	TOTAL COST	G1	G2	A	C	E	D	G4S	G4W	THRIE
	VALUES	318.45	430.17	480.88	534.94	642.09	645.53	676.79	695.69	778.95
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	G4W
	VALUES	.39	.30	.21	.18	.15	.15	.13	.12	.06
-6	STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	618.48	618.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	A	C	G3	G4W
	VALUES	24.16	38.46	55.79	56.96	58.04	60.17	61.87	62.82	73.87
	TOTAL COST	G1	G2	A	C	E	D	G4S	G4W	THRIE
	VALUES	316.93	429.64	476.52	531.30	642.35	645.65	676.27	692.51	775.44
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	G4W
	VALUES	.40	.31	.22	.19	.15	.15	.13	.12	.07
-8	STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	618.48	618.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	A	C	G3	G4W
	VALUES	25.63	36.96	53.24	53.80	53.98	58.17	59.58	59.86	70.97
	TOTAL COST	G1	G2	A	C	E	D	G4S	G4W	THRIE
	VALUES	315.44	429.11	472.45	528.06	638.45	639.45	651.65	671.72	769.61
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	G4W
	VALUES	.40	.31	.23	.19	.16	.15	.14	.13	.07

A.195

4R-8-10

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 8-FT SHOULDER

4R-8-12

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 20 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 132.26

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	G3	C	B	G4W
VALUES	31.01	40.18	69.15	69.65	73.56	78.39	79.54	84.23	87.83	94.03	94.22
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	318.66	434.49	498.01	556.30	652.04	662.51	663.13	687.63	712.69	796.87	1402.71
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.33	.25	.13	.11	.10	.10	.09	.07	.07	.06	.04

8	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	G3	C	B	G4W
VALUES	30.33	39.49	68.18	68.93	72.15	76.73	78.25	82.64	85.38	92.19	92.37
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	317.47	433.81	496.72	553.85	650.62	660.67	662.41	686.65	710.85	795.20	1401.12
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.33	.25	.13	.11	.10	.10	.10	.08	.07	.06	.04

6	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	G3	C	B	G4W
VALUES	29.66	38.79	67.09	68.14	70.77	74.81	76.76	80.81	82.76	90.21	90.39
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	317.26	433.14	495.24	551.24	649.25	658.69	661.62	685.57	706.87	793.29	1399.28
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.34	.25	.13	.11	.11	.11	.11	.08	.07	.07	.04

4	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	G3	C	B	G4W
VALUES	29.02	38.04	65.84	67.25	69.42	72.61	74.96	78.67	79.96	88.07	88.24
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	316.51	432.49	493.44	548.43	647.89	656.54	660.73	684.32	706.72	791.08	1397.14
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.34	.26	.14	.11	.11	.11	.11	.08	.08	.07	.04

2	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	G3	C	B	G4W
VALUES	28.40	37.20	64.38	66.23	68.06	70.08	72.72	76.18	76.93	85.70	85.88
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	315.68	431.87	491.20	545.41	645.54	654.18	659.70	682.85	704.36	788.55	1394.65
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.34	.26	.14	.12	.11	.11	.11	.09	.08	.07	.04

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 8-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 20 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 132.26

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	G3	C	B	G4W
VALUES	27.80	36.26	62.65	65.03	66.67	67.20	69.91	73.29	73.66	83.08	83.26
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	314.28	439.74	480.13	533.51	635.15	645.68	669.31	691.77	692.32	801.16	901.54
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.34	.26	.15	.13	.11	.11	.11	.09	.09	.08	.04

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	27.24	35.16	60.63	63.64	63.97	65.20	66.46	70.00	70.15	80.18	80.35
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	313.64	438.64	479.11	532.12	636.45	643.68	665.71	688.48	688.63	798.66	898.79
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.35	.26	.16	.13	.12	.12	.12	.10	.09	.08	.05

A.197

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	D	A	E	G3	C	B	G4W
VALUES	26.70	33.91	58.32	60.48	62.01	62.41	63.61	66.39	66.46	77.05	77.22
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	312.38	437.39	476.80	528.96	630.49	640.89	657.02	684.87	684.99	795.71	895.84
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.35	.26	.17	.14	.12	.12	.12	.10	.10	.09	.05

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	G3	C	B	G4W
VALUES	26.16	32.49	55.79	56.96	58.04	60.17	61.87	62.71	62.82	73.87	74.04
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	310.97	425.97	474.27	525.44	626.52	638.65	658.29	686.15	689.31	792.34	892.48
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.36	.26	.18	.15	.12	.12	.12	.10	.10	.09	.05

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	G3	C	B	G4W
VALUES	25.63	31.01	53.24	53.80	53.98	58.17	59.38	59.58	59.98	70.97	71.14
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	304.11	434.49	471.72	522.28	626.46	636.65	658.27	687.13	689.29	793.31	893.62
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.36	.26	.19	.16	.13	.12	.12	.11	.11	.10	.06

4R-8-12

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 10 FT

4R-10-0

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 10 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 92.59

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE
OF CURVE

1 2 3 4 5 6 7 8 9 10 11

10 STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	A	E	G2	C	B	G4W	G1
VALUES	67.22	67.23	71.91	72.59	73.91	79.14	85.39	92.12	92.28	161.89
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	440.36	482.62	491.06	553.87	652.38	660.59	660.71	685.70	790.39	1403.19
BENEFIT/COST	A	D	G4S	G2	E	THRIE	C	B	G4W	G1
VALUES	.05	.04	.04	.03	.03	.03	.02	.01	.00	-.25

8 STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	A	E	G2	C	B	G4W	G1
VALUES	66.03	66.22	70.72	71.31	71.93	75.88	83.18	90.10	90.26	160.05
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	438.53	479.35	489.78	551.66	650.40	658.58	659.69	684.50	789.19	1401.73
BENEFIT/COST	A	D	G4S	G2	E	THRIE	C	B	G4W	G1
VALUES	.05	.04	.04	.04	.04	.03	.02	.01	.00	-.24

A.198

6 STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	A	E	G2	C	B	G4W	G1
VALUES	64.86	65.27	69.35	69.94	70.07	72.43	80.91	81.68	88.04	158.09
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	436.56	475.91	488.41	549.39	648.54	656.52	658.74	683.34	787.82	1400.16
BENEFIT/COST	A	D	G4S	G2	E	THRIE	C	B	G4W	G1
VALUES	.05	.05	.05	.04	.04	.03	.02	.01	.01	-.24

4 STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	THRIE	E	A	G2	C	B	G4W	G1
VALUES	53.67	64.32	67.76	68.29	68.41	69.74	78.52	79.92	86.04	155.96
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	434.43	472.22	486.88	547.00	646.77	654.36	657.80	682.14	786.24	1398.39
BENEFIT/COST	G2	A	D	G4S	E	THRIE	C	B	G4W	G1
VALUES	.06	.06	.05	.05	.04	.03	.03	.01	.01	-.23

2 STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	G2	THRIE	E	A	C	B	G4W	G1
VALUES	62.35	63.32	64.74	65.91	66.56	66.62	75.94	77.84	83.56	153.62
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	432.10	468.21	485.09	544.41	645.04	652.04	656.80	680.83	784.39	1396.31
BENEFIT/COST	G2	A	D	G4S	E	THRIE	C	B	G4W	G1
VALUES	.07	.06	.05	.05	.04	.04	.04	.02	.01	-.22

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 10 FT

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 10 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 92.54

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	A	E	C	G3	B	G4W	G1
VALUES	60.32	60.82	62.19	63.75	64.45	64.82	73.06	75.32	81.00	81.15	151.03
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	429.50	463.79	482.93	541.54	633.30	649.47	655.66	679.29	699.63	782.23	1393.80
BENEFIT/COST	G2	A	G4S	D	E	C	THRIE	B	G4W	G3	G1
VALUES	.08	.07	.05	.05	.05	.04	.04	.02	.02	.01	-.21

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	A	E	C	G3	B	G4W	G1
VALUES	55.37	58.96	60.83	61.22	61.79	63.01	69.79	72.24	78.10	79.25	148.10
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	426.58	458.85	480.27	538.27	641.48	646.57	654.30	677.44	696.73	779.70	1390.72
BENEFIT/COST	G2	A	G4S	D	E	C	THRIE	B	G4W	G3	G1
VALUES	.09	.07	.05	.05	.05	.05	.04	.03	.02	.02	-.20

A.199

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	A	E	C	G3	B	G4W	G1
VALUES	49.85	56.71	58.29	58.57	59.19	61.08	66.08	68.50	74.81	74.96	144.78
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	423.26	459.32	477.05	534.55	639.56	643.28	652.67	675.19	693.43	776.77	1386.98
BENEFIT/COST	G2	A	G4S	C	D	E	THRIE	B	G4W	G3	G1
VALUES	.11	.08	.06	.06	.06	.05	.05	.03	.03	.02	-.19

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	THRIE	D	E	C	G3	B	G4W	G1
VALUES	43.93	54.08	54.85	55.02	57.26	59.02	61.98	64.19	71.18	71.33	141.02
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	419.50	447.40	473.33	530.45	637.49	639.66	650.73	672.56	689.81	723.50	1382.66
BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
VALUES	.12	.09	.07	.06	.06	.06	.05	.04	.03	.02	-.17

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	G4S	THRIE	D	E	C	G3	B	G4W	G1
VALUES	38.30	51.03	51.27	51.70	55.13	56.88	57.88	59.70	67.54	67.69	136.88
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	415.36	441.77	469.50	526.36	635.36	636.02	648.60	669.74	686.16	720.18	1378.18
BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
VALUES	.13	.10	.07	.07	.06	.06	.06	.04	.04	.02	-.16

4R-10-0

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 10-FT SHOULDER

4R-10-2

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 221.67

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA											

10	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	G3	D	C	A	G4S	E	B	G4W	G2	G1
	VALUES	91.71	118.83	121.23	122.39	142.70	156.48	156.57	171.24	171.40	180.32	228.85
	TOTAL COST	G1	A	G2	C	D	E	B	G4S	G4W	THRIE	G3
	VALUES	507.32	561.18	583.80	590.87	718.71	735.05	739.71	774.95	789.87	810.16	1437.31
	BENEFIT/COST	C	A	THRIE	D	E	G4S	G2	B	G4W	G3	G1
	VALUES	.21	.19	.18	.17	.11	.11	.10	.09	.08	.08	-.03

8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	G3	D	C	A	G4S	E	B	G4W	G2	G1
	VALUES	88.83	115.60	117.84	118.34	141.04	153.89	154.14	168.71	168.87	172.68	228.85
	TOTAL COST	G1	A	G2	C	D	E	B	G4S	G4W	THRIE	G3
	VALUES	507.33	559.52	581.15	586.81	711.32	732.62	737.19	772.37	787.35	807.31	1434.07
	BENEFIT/COST	C	A	THRIE	D	E	G4S	G2	B	G4W	G3	G1
	VALUES	.22	.19	.18	.17	.12	.11	.11	.09	.09	.08	-.03

6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	B	G4W	G2	G1
	VALUES	85.88	112.01	113.97	114.19	139.02	151.01	151.46	165.78	165.94	174.61	228.86
	TOTAL COST	G1	A	G2	C	D	E	B	G4S	G4W	THRIE	G3
	VALUES	507.34	557.50	578.09	582.44	707.67	729.93	734.26	769.48	784.42	804.36	1430.49
	BENEFIT/COST	C	A	THRIE	D	E	G2	G4S	B	G4W	G3	G1
	VALUES	.23	.20	.19	.18	.12	.12	.11	.10	.09	.08	-.03

4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	B	G4W	G2	G1
	VALUES	82.82	107.99	109.23	110.22	136.53	147.72	148.44	162.36	162.52	171.01	228.88
	TOTAL COST	G1	A	G2	C	D	E	B	G4S	G4W	THRIE	G3
	VALUES	507.35	555.00	574.48	577.70	703.70	726.91	730.84	766.20	780.99	801.30	1426.46
	BENEFIT/COST	C	A	THRIE	D	E	G2	G4S	B	G4W	G3	G1
	VALUES	.24	.20	.19	.19	.13	.13	.12	.10	.10	.09	-.03

2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	B	G4W	G2	G1
	VALUES	79.59	103.42	104.04	105.85	133.42	143.91	144.46	158.30	158.46	166.71	226.89
	TOTAL COST	G1	A	G2	C	D	E	B	G4S	G4W	THRIE	G3
	VALUES	507.37	551.90	570.18	572.52	699.33	723.44	726.78	762.39	776.44	798.07	1421.90
	BENEFIT/COST	C	A	THRIE	D	G2	E	G4S	B	G4W	G3	G1
	VALUES	.25	.21	.20	.20	.14	.13	.13	.11	.10	.09	-.03

A.200

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 10-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 221.67
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	D	A	G4S	E	B	G4W	G1	G2	G1	G1
VALUES	26.13	98.17	98.30	100.46	124.53	134.41	140.90	153.45	153.61	161.53	228.91	228.91
TOTAL COST	G1	A	G2	C	D	E	B	G4S	G4W	THRIE	G3	G3
VALUES	507.34	548.00	565.00	566.77	694.44	714.38	721.93	757.84	772.08	794.60	1416.64	1416.64
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1	G1
VALUES	.26	.22	.20	.15	.14	.13	.12	.11	.09	.03		

-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	D	A	G4S	E	B	G4W	G1	G2	G1	G1
VALUES	72.34	91.87	92.08	95.44	124.66	134.05	136.10	147.63	147.78	155.26	228.94	228.94
TOTAL COST	G1	A	G2	C	D	E	B	G4S	G4W	THRIE	G3	G3
VALUES	507.42	543.14	558.73	560.35	688.92	714.58	716.10	752.52	766.26	790.82	1410.56	1410.56
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1	G1
VALUES	.28	.23	.21	.16	.15	.14	.13	.12	.10	.03		

A.201

-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	D	A	G4S	E	B	G4W	G1	G2	G1	G1
VALUES	68.14	84.71	85.10	89.22	118.69	127.69	130.44	140.71	140.86	147.76	228.98	228.98
TOTAL COST	G1	A	G2	C	D	E	B	G4S	G4W	THRIE	G3	G3
VALUES	507.45	537.17	551.24	553.18	682.70	708.91	709.18	746.17	759.34	786.66	1403.57	1403.57
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1	G1
VALUES	.29	.25	.22	.18	.16	.15	.14	.13	.10	.03		

-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	D	A	G4S	E	B	G4W	G1	G2	G1	G1
VALUES	63.74	77.02	77.42	82.48	111.72	120.44	123.97	132.82	132.97	139.17	229.02	229.02
TOTAL COST	G1	A	G2	C	D	E	B	G4S	G4W	THRIE	G3	G3
VALUES	507.49	530.19	542.64	545.49	675.95	701.30	702.45	738.91	751.45	782.22	1395.89	1395.89
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1	G1
VALUES	.31	.26	.23	.20	.17	.16	.15	.14	.11	.03		

-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	D	A	G4S	E	B	G4W	G1	G2	G1	G1
VALUES	59.36	69.64	69.91	75.89	104.36	112.86	117.16	124.67	124.81	130.24	229.06	229.06
TOTAL COST	G1	A	G2	C	D	E	B	G4S	G4W	THRIE	G3	G3
VALUES	507.53	522.83	533.71	538.11	669.36	693.14	695.63	731.33	743.24	772.83	1388.39	1388.39
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1	G1
VALUES	.32	.28	.25	.23	.18	.17	.16	.15	.12	.03		

4R-10-2

4R-10-4

4-LANE RURAL ROAD WITH 10-FT SHOULDER

SUMMARY OF RESULTS

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 193.76
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
10	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48
SOCIETAL COST	G4S	D	A	THRIE	G2	G3	C	E	B	G4W
VALUES	71.20	71.21	72.59	73.62	79.14	84.71	85.39	91.24	96.83	204.46
TOTAL COST	G2	G1	A	C	D	B	E	G4S	G4W	THRIE
VALUES	482.62	482.93	491.06	553.87	664.69	665.30	669.72	689.67	715.46	792.10
BENEFIT/COST	A	G2	C	D	G4S	E	B	THRIE	G4W	G3
VALUES	.29	.28	.23	.21	.20	.18	.17	.16	.08	-.04
8	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48
SOCIETAL COST	G4S	D	A	THRIE	G2	G3	C	E	B	G4W
VALUES	69.92	70.11	71.31	72.40	75.88	83.18	83.26	87.64	94.67	203.88
TOTAL COST	G2	G1	A	C	B	D	E	G4S	G4W	THRIE
VALUES	479.35	492.36	489.78	551.66	663.15	663.59	666.12	688.40	713.31	790.88
BENEFIT/COST	A	G2	C	D	G4S	E	B	THRIE	G4W	G3
VALUES	.29	.29	.24	.21	.20	.18	.17	.16	.08	-.04
6	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48
SOCIETAL COST	G4S	D	A	THRIE	G2	G3	C	E	B	G4W
VALUES	68.64	69.04	69.94	71.09	72.43	80.91	81.68	84.17	92.46	203.25
TOTAL COST	G2	G1	A	C	B	D	E	G4S	G4W	THRIE
VALUES	475.91	481.73	488.41	549.39	660.93	662.52	662.65	687.12	711.09	789.56
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3
VALUES	.30	.30	.24	.21	.20	.19	.18	.17	.16	-.03
4	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48
SOCIETAL COST	G4S	D	A	THRIE	G2	G3	C	E	B	G4W
VALUES	67.28	67.94	68.41	68.74	69.61	78.52	79.92	80.95	90.12	202.56
TOTAL COST	G2	G1	A	C	B	D	E	G4S	G4W	THRIE
VALUES	472.22	481.04	486.88	547.00	658.60	659.32	661.42	685.76	708.76	788.08
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3
VALUES	.31	.30	.25	.21	.20	.20	.18	.17	.17	-.03
2	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48
SOCIETAL COST	G4S	D	A	THRIE	G2	G3	C	E	B	G4W
VALUES	64.74	65.78	66.62	66.75	67.86	75.94	77.66	77.84	87.60	201.80
TOTAL COST	G2	G1	A	C	B	D	E	G4S	G4W	THRIE
VALUES	468.21	480.28	485.04	544.41	656.07	656.14	660.22	684.25	705.23	786.33
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3
VALUES	.32	.30	.25	.21	.21	.20	.19	.18	.17	-.03

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 10-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 193.76

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

0 STATE COST	G1	G2	A	C	B	D	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	593.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	D	THRIE	C	E	G3	B	G4W	G1	G1
VALUES	60.32	64.03	64.45	65.39	65.72	73.06	74.62	75.32	84.78	84.78	200.46	200.46
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3	G3
VALUES	463.79	479.43	482.93	541.54	653.10	653.26	658.87	682.50	703.42	784.20	1393.80	1393.80
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3	G1	G1
VALUES	.33	.31	.26	.22	.21	.21	.21	.19	.18	.09	-.03	-.03

-2 STATE COST	G1	G2	A	C	B	D	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	593.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	G4S	THRIE	D	C	E	G3	B	G4W	G1	G1
VALUES	55.37	61.79	61.94	63.08	63.80	69.79	71.70	72.24	81.59	81.74	200.02	200.02
TOTAL COST	G2	G1	A	C	B	D	E	G4S	G4W	THRIE	G3	G3
VALUES	458.85	478.49	480.27	538.27	650.07	650.18	657.28	680.42	700.22	781.55	1390.72	1390.72
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3	G1	G1
VALUES	.34	.32	.26	.22	.21	.21	.20	.18	.18	.09	-.02	-.02

-4 STATE COST	G1	G2	A	C	B	D	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	593.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	G4S	THRIE	D	C	E	G3	B	G4W	G1	G1
VALUES	49.85	58.57	59.45	59.85	61.92	66.08	68.50	68.90	77.95	78.10	198.95	198.95
TOTAL COST	G2	A	G1	C	B	D	E	G4S	G4W	THRIE	G3	G3
VALUES	453.32	477.05	477.43	534.55	646.43	647.37	655.39	672.93	696.58	778.33	1386.98	1386.98
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3	G1	G1
VALUES	.36	.32	.27	.22	.22	.22	.20	.19	.19	.10	-.02	-.02

-6 STATE COST	G1	G2	A	C	B	D	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	593.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	THRIE	G4S	D	C	E	G3	B	G4W	G1	G1
VALUES	43.93	54.85	56.11	56.56	59.72	61.98	64.19	66.18	73.92	74.07	197.74	197.74
TOTAL COST	G2	A	G1	C	B	D	E	G4S	G4W	THRIE	G3	G3
VALUES	447.40	473.33	476.21	530.45	642.40	644.66	653.20	675.04	692.55	774.59	1382.66	1382.66
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3	G1	G1
VALUES	.37	.33	.28	.23	.22	.22	.21	.19	.19	.10	-.01	-.01

-8 STATE COST	G1	G2	A	C	B	D	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	593.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	THRIE	G4S	D	C	E	G3	B	G4W	G1	G1
VALUES	38.30	51.03	52.25	53.47	57.30	57.88	59.70	63.58	69.84	69.98	196.32	196.32
TOTAL COST	G2	A	G1	C	B	D	E	G4S	G4W	THRIE	G3	G3
VALUES	441.77	469.50	474.80	526.36	638.31	642.06	650.78	671.94	688.46	770.73	1378.18	1378.18
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3	G1	G1
VALUES	.39	.34	.29	.23	.23	.23	.22	.20	.20	.10	-.01	-.01

A.203

4R-10-4

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 10-FT SHOULDER

4R-10-6

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 169.90

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	C	G3	B	G4W	G1
VALUES	37.70	67.22	67.23	71.91	73.91	75.02	82.77	85.08	89.59	89.75	143.66
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	422.14	441.17	493.50	551.25	652.38	658.07	660.71	685.70	708.23	790.39	1403.56
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G1	G3
VALUES	.33	.23	.19	.17	.17	.17	.14	.14	.13	.09	.06

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	C	G3	B	G4W	G1
VALUES	36.46	66.03	66.22	70.72	71.93	73.57	80.76	83.56	87.76	87.92	142.86
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	421.34	439.94	492.04	549.23	650.40	656.23	659.69	684.50	706.40	789.19	1402.04
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1	G3
VALUES	.33	.23	.19	.17	.17	.17	.14	.14	.13	.10	.07

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	C	G3	B	G4W	G1
VALUES	35.30	64.86	65.27	69.35	70.07	72.04	78.59	81.93	85.80	85.96	141.91
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	420.39	438.78	490.57	547.07	648.54	654.28	658.74	683.34	704.44	787.82	1400.40
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1	G3
VALUES	.33	.23	.19	.18	.17	.17	.15	.14	.14	.10	.07

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	C	G3	B	G4W	G1
VALUES	34.18	63.67	64.32	67.76	68.29	70.50	76.27	80.10	83.71	83.87	140.77
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	419.24	437.65	488.98	544.75	646.77	652.19	657.80	682.14	702.35	786.24	1398.57
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1	G3
VALUES	.34	.24	.20	.18	.18	.17	.15	.14	.14	.10	.07

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	C	G3	B	G4W	G1
VALUES	33.06	62.35	63.32	65.91	66.56	68.65	73.75	77.96	81.45	81.61	139.36
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	417.84	436.53	487.13	542.22	645.04	649.93	656.80	680.83	700.09	784.39	1396.44
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1	G3
VALUES	.34	.24	.21	.18	.18	.17	.16	.14	.14	.11	.07

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 10-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 169.90

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	E	A	C	G3	B	G4W	G1
	VALUES	31.89	60.82	62.19	63.75	64.82	66.38	70.99	75.40	79.00	79.15	137.63
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	416.11	435.37	484.86	539.46	643.30	647.47	655.66	679.29	697.63	782.23	1393.87
	BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G4W	G1	G3
	VALUES	.34	.25	.21	.18	.18	.18	.16	.15	.15	.12	.07

-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	E	A	C	G3	B	G4W	G1
	VALUES	30.64	58.96	60.83	61.22	63.01	63.52	67.93	72.28	76.30	76.46	135.50
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	413.97	434.12	482.00	536.41	641.48	644.78	654.30	677.44	694.93	779.70	1390.75
	BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G4W	G1	G3
	VALUES	.35	.25	.22	.18	.18	.18	.16	.15	.15	.12	.07

A.205

-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	A	E	C	G3	B	G4W	G1
	VALUES	29.27	56.71	58.29	59.19	61.08	61.08	64.56	68.52	73.34	73.50	132.87
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	411.35	432.74	478.46	533.04	639.56	641.82	652.67	675.19	691.97	776.77	1386.99
	BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G4W	G1	G3
	VALUES	.35	.26	.22	.19	.19	.18	.17	.16	.16	.13	.08

-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	A	E	C	G3	B	G4W	G1
	VALUES	27.76	54.08	55.02	55.82	57.26	59.02	60.94	64.19	70.17	70.32	129.22
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	408.19	431.24	474.30	529.41	637.49	638.65	650.73	672.56	688.80	773.50	1382.66
	BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G4W	G1	G3
	VALUES	.35	.27	.23	.19	.19	.19	.18	.16	.16	.14	.08

-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	A	E	C	G3	B	G4W	G1
	VALUES	26.21	51.27	51.51	51.70	55.13	56.88	57.36	59.70	67.04	67.18	126.10
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	404.57	429.68	469.99	525.84	635.36	635.51	648.60	669.24	685.66	770.18	1378.18
	BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G4W	G1	G3
	VALUES	.36	.28	.24	.20	.19	.19	.18	.17	.16	.16	.08

4R-10-6

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 10-FT SHOULDER

4R-10-8

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 18 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 149.56

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	D	D	E	THRIE	A	G3	G1	C	B	G4W
VALUES	31.88	64.62	64.69	70.43	71.91	73.86	79.83	83.67	83.88	88.44	88.61
TOTAL COST	G1	G2	A	C	E	B	D	G4S	D	THRIE	G3
VALUES	362.14	435.35	492.33	552.36	648.91	656.92	658.09	683.17	707.08	790.39	1398.31
BENEFIT/COST	G2	G1	A	D	C	G4S	E	THRIE	B	G4W	G3
VALUES	.29	.24	.18	.14	.14	.14	.14	.11	.11	.10	.05
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	G3	G1	C	B	G4W
VALUES	30.42	63.68	63.79	68.81	70.72	72.59	78.52	80.36	81.68	86.80	86.96
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	358.83	434.40	491.07	550.15	647.29	655.28	657.27	682.16	705.44	789.19	1386.49
BENEFIT/COST	G2	G1	A	C	D	E	G4S	B	THRIE	G4W	G3
VALUES	.29	.25	.18	.14	.14	.14	.14	.11	.11	.10	.05
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	G1	G3	C	B	G4W
VALUES	30.05	62.63	62.95	67.24	69.35	71.32	76.87	77.11	79.33	85.04	85.20
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	355.34	433.53	489.79	547.81	645.72	653.52	656.43	681.10	703.68	787.82	1395.58
BENEFIT/COST	G2	G1	A	C	D	E	G4S	B	THRIE	G4W	G3
VALUES	.30	.26	.19	.15	.15	.14	.14	.11	.11	.10	.05
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	619.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	G1	G3	C	B	G4W
VALUES	29.25	61.49	62.07	65.72	67.76	69.92	73.13	75.52	76.82	83.14	83.30
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	351.61	432.73	488.40	545.30	644.19	651.62	655.55	679.97	701.78	786.24	1394.00
BENEFIT/COST	G2	G1	A	C	D	E	G4S	B	THRIE	G4W	G3
VALUES	.30	.27	.19	.16	.15	.14	.14	.12	.11	.11	.06
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	G1	G3	C	B	G4W
VALUES	28.48	60.24	61.14	64.22	65.91	68.26	69.08	73.66	74.12	81.06	81.22
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	347.56	431.95	486.73	542.60	642.70	649.54	654.61	678.72	699.70	784.39	1392.14
BENEFIT/COST	G2	G1	A	C	D	E	G4S	B	THRIE	G4W	G3
VALUES	.30	.29	.19	.16	.15	.15	.14	.12	.12	.11	.06

A.206

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 10-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 18 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 149,56

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

0	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
278.48	VALUES	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	E	THRIE	G1	A	C	G3	B	G4W
27.68	VALUES	58.82	60.11	62.23	63.75	64.61	66.14	71.21	71.21	71.40	78.77	78.92
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
343.08	VALUES	431.16	484.62	539.69	641.21	647.24	653.59	677.29	697.40	782.23	1389.88	
	BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G4W	G3
	VALUES	.31	.30	.20	.17	.15	.15	.12	.12	.11	.06	

-2	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
278.48	VALUES	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	E	THRIE	G1	A	C	G3	B	G4W
26.83	VALUES	57.17	58.97	59.60	61.22	61.23	63.41	68.04	68.04	68.62	76.14	76.34
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
338.08	VALUES	430.30	481.89	536.52	639.71	644.67	652.44	675.64	694.82	779.70	1387.10	
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
	VALUES	.32	.30	.21	.17	.15	.15	.13	.12	.12	.04	

A.207

-4	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
278.48	VALUES	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	E	THRIE	G1	A	C	G3	B	G4W
25.87	VALUES	54.03	55.25	57.67	58.29	59.68	59.94	64.60	65.25	73.30	73.46	
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
332.50	VALUES	429.35	478.42	533.08	638.16	641.78	651.15	673.73	691.93	776.77	1383.72	
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
	VALUES	.34	.31	.21	.18	.16	.15	.13	.13	.12	.06	

-6	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
278.48	VALUES	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	E	THRIE	A	D	C	G3	B	G4W
24.82	VALUES	48.05	53.07	55.02	55.81	56.21	58.07	60.44	61.35	70.17	70.31	
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
326.52	VALUES	428.30	474.29	529.42	636.55	638.64	649.49	671.55	688.79	773.50	1379.82	
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
	VALUES	.36	.31	.22	.19	.16	.16	.14	.13	.13	.07	

-8	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
278.48	VALUES	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	E	THRIE	D	E	C	G3	B	G4W
23.75	VALUES	42.35	50.77	51.51	51.70	54.61	56.42	57.32	57.36	67.04	67.18	
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
320.83	VALUES	427.22	469.99	525.84	634.89	635.51	648.08	669.24	685.66	770.18	1375.80	
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
	VALUES	.38	.31	.23	.20	.16	.16	.15	.14	.13	.07	

4R-10-8

4R-10-10

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 10-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 20 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 132.26
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	D	G4S	E	THRIE	A	G3	B	G4W
VALUES	29.13	54.50	63.43	63.53	70.43	71.91	73.86	78.83	88.44	88.61
TOTAL COST	G1	G2	A	C	E	D	B	G4S	THRIE	G3
VALUES	332.97	432.60	442.33	552.36	648.91	656.91	656.92	682.00	790.39	1398.31
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G3
VALUES	.28	.26	.14	.12	.11	.11	.10	.08	.07	.04

8 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	G3	B	G4W
VALUES	28.37	51.70	62.71	62.80	68.81	70.72	72.59	81.68	86.80	86.96
TOTAL COST	G1	G2	A	C	E	D	B	G4S	THRIE	G3
VALUES	330.18	431.84	441.07	550.15	647.29	655.28	656.27	681.18	789.19	1396.99
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G3
VALUES	.29	.26	.14	.12	.11	.11	.11	.09	.07	.04

6 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	G3	B	G4W
VALUES	27.62	49.06	61.85	62.16	67.24	69.35	71.32	77.11	85.04	85.20
TOTAL COST	G1	G2	A	C	E	D	B	G4S	THRIE	G3
VALUES	327.54	431.09	449.79	547.81	645.72	653.52	655.64	680.33	787.82	1395.58
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G3
VALUES	.30	.26	.15	.12	.11	.11	.11	.09	.08	.04

4 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	G3	B	G4W
VALUES	26.84	46.59	60.41	61.48	65.72	67.76	69.42	75.52	83.14	83.30
TOTAL COST	G1	G2	A	C	E	D	B	G4S	THRIE	G3
VALUES	325.07	430.36	448.40	545.30	644.19	651.62	654.96	679.39	786.24	1394.00
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G3
VALUES	.31	.26	.15	.12	.12	.12	.12	.09	.08	.04

2 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	G3	B	G4W
VALUES	26.18	44.27	59.85	60.74	64.22	65.91	68.26	73.66	81.06	81.22
TOTAL COST	G1	G2	A	C	E	D	B	G4S	THRIE	G3
VALUES	322.74	429.65	448.73	542.60	642.70	649.54	654.21	678.32	784.39	1392.14
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G3
VALUES	.32	.26	.15	.12	.12	.12	.12	.09	.08	.04

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 10-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 20 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 132.26

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	G3	B	G4W
VALUES	25.50	42.07	58.58	59.87	62.73	63.75	66.14	71.21	71.40	78.77	78.92
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	320.55	428.48	484.62	539.69	641.21	647.24	653.35	672.06	697.40	782.23	1389.88
BENEFIT/COST	G1	G2	A	C	D	E	G4S	THRIE	B	G4W	G3
VALUES	.32	.26	.16	.13	.12	.12	.12	.10	.09	.09	.05

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	C	G3	B	G4W
VALUES	24.87	39.97	57.05	58.85	61.22	61.23	63.41	68.04	68.62	76.19	76.34
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	318.45	428.35	481.89	536.52	639.71	644.67	652.33	675.53	694.82	779.70	1387.10
BENEFIT/COST	G1	G2	A	C	D	E	G4S	THRIE	B	G4W	G3
VALUES	.33	.27	.16	.14	.12	.12	.12	.10	.10	.09	.05

A.209

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	C	G3	B	G4W
VALUES	24.28	37.96	55.21	57.63	58.29	59.68	59.94	64.60	65.25	73.30	73.46
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	316.44	427.76	478.42	533.08	638.16	641.78	651.11	673.69	691.93	776.77	1383.72
BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G4W	G3
VALUES	.34	.27	.17	.14	.13	.13	.12	.10	.10	.10	.05

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	C	G3	B	G4W
VALUES	23.73	36.03	53.07	55.02	55.81	56.20	58.07	60.94	61.35	70.17	70.31
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	314.50	427.20	474.29	529.42	636.55	638.64	649.68	671.54	688.79	773.50	1379.82
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.35	.27	.18	.15	.13	.13	.13	.11	.11	.10	.05

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	A	THRIE	D	F	G3	C	B	G4W
VALUES	23.20	34.24	50.77	51.51	51.70	54.61	56.42	57.32	57.36	67.04	67.18
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	312.71	426.68	469.99	525.84	634.89	635.51	648.08	669.24	685.66	770.18	1375.80
BENEFIT/COST	G1	G2	A	C	G4S	E	D	B	THRIE	G4W	G3
VALUES	.35	.27	.19	.16	.13	.13	.13	.11	.11	.11	.06

4R-10-10

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 10-FT SHOULDER

4R-10-12

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 22 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 117.56
 ADOT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

10	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	D	G4S	E	THRIE	A	C	G3	C	B	G4W
VALUES	29.13	37.15	63.43	63.53	70.43	71.91	73.86	77.17	83.88	88.44	88.61	88.61
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3	G3
VALUES	315.63	432.60	482.33	552.36	648.91	656.91	656.92	682.00	707.08	790.39	1395.64	1395.64
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3	G3
VALUES	.29	.22	.10	.09	.09	.08	.07	.06	.05	.05	.03	.03

8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	G3	C	B	G4W
VALUES	28.37	36.28	62.71	62.80	68.81	70.72	72.59	76.05	81.68	86.80	86.96	86.96
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3	G3
VALUES	314.76	431.84	481.07	550.15	647.29	655.28	655.27	681.18	705.44	789.19	1394.52	1394.52
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3	G3
VALUES	.29	.22	.11	.09	.09	.08	.07	.07	.05	.05	.03	.03

A.210

6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	G3	C	B	G4W
VALUES	27.62	35.48	61.85	62.16	67.24	69.35	71.32	74.75	79.33	85.04	85.20	85.20
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3	G3
VALUES	313.96	431.04	489.79	547.81	645.72	653.52	655.64	680.33	703.68	787.82	1393.23	1393.23
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3	G3
VALUES	.29	.22	.11	.09	.09	.09	.08	.07	.06	.05	.03	.03

4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	G3	C	B	G4W
VALUES	26.89	34.71	60.91	61.48	65.72	67.76	69.92	73.23	76.82	83.14	83.30	83.30
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3	G3
VALUES	313.19	430.36	488.40	545.30	644.19	651.62	654.96	679.39	701.78	786.24	1391.71	1391.71
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3	G3
VALUES	.30	.22	.11	.09	.09	.09	.09	.07	.06	.06	.03	.03

2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	C	G3	C	B	G4W
VALUES	26.18	33.93	59.85	60.74	64.22	65.91	68.26	71.44	74.12	81.06	81.22	81.22
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3	G3
VALUES	312.40	429.65	486.73	542.60	642.70	649.54	654.21	678.32	699.70	784.39	1389.91	1389.91
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3	G3
VALUES	.30	.23	.12	.10	.09	.09	.09	.07	.06	.06	.03	.03

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 10-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 22 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 112.56

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	G3	C	B	G4W
VALUES	25.50	33.08	58.58	59.87	62.73	63.75	66.14	69.29	71.21	78.77	78.92
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	311.55	428.48	484.62	529.69	641.21	647.24	653.35	677.06	697.40	782.23	1387.77
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.30	.23	.12	.10	.10	.10	.09	.07	.07	.06	.04
-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	24.87	32.11	57.05	58.85	61.22	61.23	63.41	66.73	68.04	76.19	76.34
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	310.59	428.35	481.89	536.52	639.71	644.67	652.33	675.53	694.82	779.20	1385.21
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.31	.23	.13	.11	.10	.10	.10	.08	.07	.07	.04
-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	24.28	31.00	55.21	57.63	58.29	59.68	59.94	63.71	64.60	73.30	73.46
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	309.47	427.76	478.42	533.08	638.16	641.78	651.11	673.69	691.93	776.77	1382.18
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.31	.23	.14	.11	.10	.10	.10	.08	.08	.07	.04
-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	23.73	29.72	53.07	55.02	55.81	56.20	58.07	60.28	60.94	70.17	70.31
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	308.20	427.20	474.29	529.42	636.55	638.64	649.68	671.54	688.79	773.50	1378.76
BENEFIT/COST	G1	G2	A	C	G4S	D	E	THRIE	B	G4W	G3
VALUES	.32	.23	.15	.12	.10	.10	.10	.09	.08	.08	.04
-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	A	THRIE	D	E	G3	C	B	G4W
VALUES	23.20	28.35	50.77	51.51	51.70	54.61	56.42	56.80	57.36	67.04	67.18
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	306.83	426.68	469.99	525.84	634.89	635.51	648.08	664.24	685.66	770.18	1375.77
BENEFIT/COST	G1	G2	A	C	G4S	D	E	THRIE	B	G4W	G3
VALUES	.32	.23	.16	.13	.11	.11	.11	.09	.09	.08	.05

A.211

4R-10-12

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 12 FT

4R-12-0

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 80.73

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	D	G4S	THRIE	A	E	G3	G2	C	B	G4W	G1
VALUES	61.82	62.16	64.98	66.92	70.92	72.73	77.98	80.85	86.34	86.48	149.51
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	427.48	481.45	485.39	549.32	649.40	654.81	655.24	680.63	704.95	783.45	1396.20
BENEFIT/COST	A	D	G4S	THRIE	E	G2	G3	C	G4W	B	G1
VALUES	.03	.03	.03	.02	.02	.01	.00	-.00	-.01	-.01	-.25
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	D	G4S	THRIE	A	E	G2	G3	C	B	G4W	G1
VALUES	60.56	60.76	64.05	65.65	68.69	75.01	76.28	78.71	84.37	84.51	147.94
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	426.42	478.49	484.12	547.19	647.17	652.84	654.04	679.24	702.99	782.53	1394.76
BENEFIT/COST	A	D	G4S	THRIE	E	G2	C	G3	G4W	B	G1
VALUES	.04	.03	.03	.02	.02	.01	.00	-.01	-.01	-.01	-.24
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	D	G4S	THRIE	A	E	G2	G3	C	B	G4W	G1
VALUES	59.44	59.47	63.01	64.37	66.57	71.85	74.83	76.53	82.37	82.52	146.27
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	424.74	475.33	482.85	545.01	645.05	650.85	652.91	677.95	700.99	781.49	1393.31
BENEFIT/COST	A	D	G4S	THRIE	E	G2	C	G3	G4W	B	G1
VALUES	.04	.04	.03	.02	.02	.02	.01	.00	-.00	-.00	-.24
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	D	G4S	THRIE	A	E	G2	G3	C	B	G4W	G1
VALUES	59.27	58.42	61.82	63.05	64.57	68.46	73.32	74.29	80.33	80.47	144.45
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	422.93	471.93	481.52	542.76	643.05	648.81	651.89	676.74	698.95	780.29	1391.80
BENEFIT/COST	A	D	G4S	G2	E	THRIE	C	G3	B	G4W	G1
VALUES	.04	.04	.04	.03	.03	.03	.01	.01	.00	.00	-.23
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	D	G4S	THRIE	A	E	G2	G3	C	B	G4W	G1
VALUES	57.08	57.46	60.43	61.59	62.67	64.76	71.65	71.93	78.20	78.34	142.47
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	420.95	468.24	480.07	540.40	641.15	646.67	650.93	675.55	696.81	778.91	1390.13
BENEFIT/COST	A	D	D	G4S	E	THRIE	C	G3	B	G4W	G1
VALUES	.05	.04	.04	.04	.03	.03	.02	.01	.00	.00	-.22

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH EMBANKMENT HINGE AT 12 FT

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 80.73

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11
PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G4S	D	THRIE	A	G2	E	C	G3	B	G4W	G1
	VALUES	55.81	56.48	58.82	59.90	60.69	60.81	69.35	69.71	75.88	76.02	140.29
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	419.26	464.16	478.37	537.83	639.29	644.36	649.96	674.28	694.50	777.29	1388.18
	BENEFIT/COST	A	G2	D	G4S	E	THRIE	C	B	G3	G4W	G1
	VALUES	.05	.05	.04	.04	.03	.03	.02	.01	.01	.01	-.21

-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G4S	D	G2	THRIE	A	E	C	G3	B	G4W	G1
	VALUES	54.33	55.38	56.09	56.89	57.82	58.93	66.46	67.31	73.30	73.44	137.84
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	416.31	458.57	476.30	534.93	637.41	641.77	648.86	672.80	691.41	775.57	1385.79
	BENEFIT/COST	G2	A	D	G4S	E	THRIE	C	B	G4W	G3	G1
	VALUES	.06	.05	.04	.04	.04	.03	.03	.01	.01	.01	-.21

A.213

-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	A	E	C	G3	B	G4W	G1
	VALUES	50.84	52.52	54.06	54.58	55.21	56.96	63.11	64.30	70.33	70.46	135.06
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	413.53	454.32	473.68	531.59	635.44	638.80	647.54	670.99	688.94	773.05	1382.78
	BENEFIT/COST	G2	A	G4S	D	E	C	THRIE	B	G4W	G3	G1
	VALUES	.07	.06	.05	.04	.04	.04	.04	.02	.02	.01	-.20

-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	A	D	E	C	G3	B	G4W	G1
	VALUES	44.88	50.30	51.80	51.96	52.47	54.88	59.25	60.58	66.92	67.05	131.87
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	410.35	448.35	470.44	527.73	633.36	635.34	645.94	669.77	685.53	770.28	1379.06
	BENEFIT/COST	G2	A	G4S	D	C	E	THRIE	B	G4W	G3	G1
	VALUES	.09	.07	.05	.05	.05	.04	.04	.02	.02	.02	-.18

-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	A	THRIE	D	E	C	G3	B	G4W	G1
	VALUES	38.51	47.76	48.25	48.64	50.65	52.76	55.05	56.32	63.21	63.35	128.28
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	406.76	441.99	466.73	523.53	631.24	631.69	644.13	666.24	681.82	767.13	1374.79
	BENEFIT/COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
	VALUES	.10	.08	.05	.05	.05	.05	.04	.03	.03	.02	-.17

4R-12-0

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 12-FT SHOULDER

4R-12-2

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 193.76

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	D	C	A	E	G4S	B	G4W	G2	G1	
VALUES	88.60	112.15	117.80	118.14	128.20	145.44	145.54	158.02	158.16	164.62	199.53	
TOTAL COST	G1	A	G2	C	D	E	B	G4S	G4W	THRIE	G3	
VALUES	478.01	546.68	568.10	586.61	711.27	723.91	726.44	764.07	776.64	807.08	1430.62	
BENEFIT/COST	C	A	THRIE	D	E	G4S	G2	B	G3	G4W	G1	
VALUES	.16	.16	.15	.13	.08	.08	.07	.06	.06	.06	-.02	

8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	C	D	A	E	G4S	B	G4W	G2	G1	
VALUES	85.82	109.51	114.71	114.85	127.10	143.44	143.51	156.20	156.34	162.79	199.53	
TOTAL COST	G1	A	G2	C	D	E	B	G4S	G4W	THRIE	G3	
VALUES	478.01	545.58	566.26	583.18	708.32	721.92	724.67	761.98	774.81	804.30	1427.99	
BENEFIT/COST	C	A	THRIE	D	E	G4S	G2	B	G3	G4W	G1	
VALUES	.17	.16	.15	.13	.09	.08	.08	.07	.06	.06	-.02	

6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	C	D	A	E	G4S	B	G4W	G2	G1	
VALUES	82.97	106.56	110.93	111.65	125.77	141.21	141.26	154.06	154.20	160.65	199.54	
TOTAL COST	G1	A	G2	C	D	E	B	G4S	G4W	THRIE	G3	
VALUES	478.01	544.25	564.12	579.41	705.13	719.74	722.54	759.64	772.68	801.44	1425.04	
BENEFIT/COST	C	A	THRIE	D	E	G4S	G2	B	G3	G4W	G1	
VALUES	.18	.16	.15	.14	.09	.08	.08	.07	.07	.06	-.02	

4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	C	D	A	E	G4S	B	G4W	G2	G1	
VALUES	80.02	103.23	106.77	108.16	124.13	138.63	138.85	151.54	151.68	158.12	199.54	
TOTAL COST	G1	A	G2	C	D	E	B	G4S	G4W	THRIE	G3	
VALUES	478.02	542.60	561.60	575.25	701.63	717.33	720.02	757.11	770.16	798.49	1421.71	
BENEFIT/COST	C	A	THRIE	D	E	G4S	G2	B	G3	G4W	G1	
VALUES	.19	.17	.16	.14	.09	.09	.09	.07	.07	.07	-.02	

2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	C	D	A	E	G4S	B	G4W	G2	G1	
VALUES	76.92	99.42	102.16	104.30	122.04	136.68	136.12	148.53	148.67	155.09	199.56	
TOTAL COST	G1	A	G2	C	D	E	B	G4S	G4W	THRIE	G3	
VALUES	478.03	540.52	558.56	570.64	697.77	714.59	717.00	754.15	767.14	795.40	1417.90	
BENEFIT/COST	C	A	THRIE	D	E	G4S	G2	B	G3	G4W	G1	
VALUES	.20	.17	.16	.15	.10	.10	.09	.08	.07	.07	-.02	

A.214

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 12-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 193,76

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE

1 2 3 4 5 6 7 8 9 10 11

0	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	B	G4W	B	G2	G1
VALUES	73.62	95.01	97.00	99.97	119.37	132.19	132.94	144.87	145.01	151.37	199.57	199.57
TOTAL COST	G1	A	G2	C	D	E	B	G4S	G4W	THRIE	G3	G3
VALUES	478.05	537.85	554.85	565.48	693.45	711.41	713.34	750.67	763.48	792.10	1413.48	1413.48
BENEFIT/COST	C	THRIE	D	THRIE	E	G2	G4S	B	G4W	G3	G1	G1
VALUES	.21	.18	.17	.16	.11	.11	.10	.09	.08	.07	.02	.02

-2	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	B	G4W	B	G2	G1
VALUES	70.03	89.82	91.16	95.04	115.91	127.99	129.15	140.38	140.51	146.75	199.59	199.59
TOTAL COST	G1	A	G2	C	D	E	B	G4S	G4W	THRIE	G3	G3
VALUES	478.07	534.38	550.22	559.63	688.52	707.62	708.85	746.47	758.99	788.51	1408.29	1408.29
BENEFIT/COST	C	THRIE	D	THRIE	E	G2	G4S	B	G4W	G3	G1	G1
VALUES	.22	.19	.17	.17	.12	.11	.11	.09	.09	.08	.02	.02

A.215

-4	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	B	G4W	B	G2	G1
VALUES	66.05	83.65	84.48	89.35	111.41	122.86	124.57	134.82	134.96	140.96	199.62	199.62
TOTAL COST	G1	A	G2	C	D	E	B	G4S	G4W	THRIE	G3	G3
VALUES	478.10	529.89	544.44	552.96	682.82	703.04	703.30	741.33	753.43	784.52	1402.13	1402.13
BENEFIT/COST	C	THRIE	D	THRIE	E	G2	G4S	B	G4W	G3	G1	G1
VALUES	.23	.20	.18	.18	.13	.12	.11	.10	.10	.08	.02	.02

-6	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	B	G4W	B	G2	G1
VALUES	61.63	76.41	76.89	82.81	105.72	116.64	119.06	128.05	128.19	133.83	199.65	199.65
TOTAL COST	G1	A	G2	C	D	E	B	G4S	G4W	THRIE	G3	G3
VALUES	478.13	524.19	537.31	545.37	676.29	696.53	697.54	735.12	746.66	780.11	1394.89	1394.89
BENEFIT/COST	C	THRIE	D	THRIE	E	G2	G4S	B	G4W	G3	G1	G1
VALUES	.25	.21	.19	.18	.15	.13	.12	.12	.11	.09	.02	.02

-8	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	B	G4W	B	G2	G1
VALUES	56.97	68.45	68.75	75.73	99.02	109.54	112.78	120.30	120.43	125.62	199.70	199.70
TOTAL COST	G1	A	G2	C	D	E	B	G4S	G4W	THRIE	G3	G3
VALUES	478.17	517.50	529.10	537.23	669.21	688.77	691.25	728.02	738.91	775.44	1386.92	1386.92
BENEFIT/COST	C	THRIE	D	THRIE	E	G2	G4S	B	G4W	G3	G1	G1
VALUES	.27	.23	.20	.19	.17	.14	.14	.13	.12	.10	.02	.02

4R-12-2

4R-12-4

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 12-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 169,90
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4S	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	D	G4S	A	THRIE	G3	G2	C	B	B	E	G1
VALUES	65.54	65.86	66.92	67.25	77.73	77.98	80.85	90.96	91.11	91.34	181.44
TOTAL COST	G1	G2	A	C	D	B	E	G4S	G4S	THRIE	G3
VALUES	459.97	481.45	485.34	549.32	659.02	659.44	669.82	709.58	709.58	785.73	1396.20
BENEFIT/COST	A	G2	C	D	G4S	THRIE	B	E	G4S	G3	G1
VALUES	.25	.23	.19	.18	.17	.14	.14	.14	.13	.07	-.04
8 STATE COST	G1	G2	A	C	B	E	D	G4S	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	D	G4S	A	THRIE	G2	G3	C	E	B	G4S	G1
VALUES	64.24	64.43	65.65	66.07	75.01	76.28	78.71	87.56	88.83	88.97	181.14
TOTAL COST	G1	G2	A	C	B	D	E	G4S	G4S	THRIE	G3
VALUES	459.62	478.49	484.12	547.19	657.31	657.72	666.04	682.90	707.45	784.54	1394.76
BENEFIT/COST	A	G2	C	D	G4S	THRIE	B	E	G4S	G3	G1
VALUES	.25	.24	.19	.18	.17	.14	.14	.14	.13	.07	-.04
6 STATE COST	G1	G2	A	C	B	E	D	G4S	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	D	G4S	A	THRIE	G2	G3	C	E	B	G4S	G1
VALUES	63.04	63.07	64.37	64.88	71.85	74.83	76.53	83.83	86.67	86.81	180.76
TOTAL COST	G1	G2	A	C	B	D	E	G4S	G4S	THRIE	G3
VALUES	459.23	475.33	482.85	545.01	655.15	656.52	666.30	681.55	705.24	783.35	1393.31
BENEFIT/COST	A	G2	C	D	G4S	E	B	THRIE	G4S	G3	G1
VALUES	.25	.24	.20	.18	.17	.15	.15	.15	.13	.07	-.04
4 STATE COST	G1	G2	A	C	B	E	D	G4S	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	D	G4S	A	THRIE	G2	G3	C	E	B	G4S	G1
VALUES	61.76	61.91	63.05	63.64	68.46	73.32	74.24	80.15	84.46	84.60	180.34
TOTAL COST	G1	G2	A	C	B	D	E	G4S	G4S	THRIE	G3
VALUES	458.81	471.93	481.52	542.76	652.93	655.39	666.63	680.24	703.07	782.11	1391.80
BENEFIT/COST	A	G2	C	D	G4S	E	B	THRIE	G4S	G3	G1
VALUES	.26	.25	.20	.18	.17	.16	.15	.15	.14	.07	-.04
2 STATE COST	G1	G2	A	C	B	E	D	G4S	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	D	G4S	A	THRIE	G2	G3	C	E	B	G4S	G1
VALUES	60.43	60.80	61.59	62.27	64.76	71.65	71.93	76.56	82.13	82.27	179.87
TOTAL COST	G1	G2	A	C	B	D	E	G4S	G4S	THRIE	G3
VALUES	458.35	468.24	480.07	540.40	650.61	654.28	655.04	678.90	700.75	780.75	1390.13
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4S	G3	G1
VALUES	.26	.26	.21	.18	.18	.16	.15	.15	.14	.07	-.04

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 12-FT SHOULDER

4R-12-4

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 169.90

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	A	THRIE	D	C	E	G3	B	E	G4W	G1
VALUES	58.97	59.64	59.90	60.66	60.66	69.35	69.71	73.06	79.60	79.60	79.74	179.36
TOTAL COST	G1	G2	A	C	B	E	D	D	G4S	G4W	THRIE	G3
VALUES	457.83	454.16	478.37	537.83	648.08	651.53	653.12	677.45	698.22	779.14	1388.18	
BENEFIT/COST	G2	A	C	D	G4S	E	B	B	THRIE	G4W	G3	G1
VALUES	.27	.26	.21	.19	.18	.17	.16	.15	.15	.08	.03	

-2	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	THRIE	D	C	E	G3	B	E	G4W	G1
VALUES	56.09	57.29	57.82	58.34	58.66	66.46	67.31	69.64	76.76	76.84	178.28	
TOTAL COST	G1	G2	A	C	B	E	D	D	G4S	G4W	THRIE	G3
VALUES	457.26	459.57	476.30	534.93	645.23	648.11	651.81	675.77	695.37	777.14	1385.79	
BENEFIT/COST	G2	A	C	D	G4S	E	B	B	THRIE	G4W	G3	G1
VALUES	.28	.27	.22	.19	.18	.17	.16	.15	.15	.08	.03	

A.217

-4	STATE COST	G1	G2	A	C	R	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	G4S	THRIE	D	C	E	G3	B	E	G4W	G1
VALUES	50.84	55.21	55.26	56.11	56.80	63.11	64.30	66.30	73.48	73.61	178.12	
TOTAL COST	G2	G1	A	C	B	E	D	D	G4S	G4W	THRIE	G3
VALUES	454.32	456.60	473.68	531.59	641.95	644.78	650.27	673.73	692.09	774.59	1382.78	
BENEFIT/COST	G2	A	C	D	G4S	E	B	B	THRIE	G4W	G3	G1
VALUES	.30	.27	.23	.19	.19	.18	.17	.16	.16	.08	.03	

-6	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	G4S	THRIE	D	C	E	G3	B	E	G4W	G1
VALUES	44.88	51.96	52.81	52.92	54.97	59.25	60.58	63.07	69.70	69.83	177.37	
TOTAL COST	G2	G1	A	C	B	E	D	D	G4S	G4W	THRIE	G3
VALUES	448.35	455.85	470.44	527.73	638.18	641.55	648.44	671.28	688.31	771.40	1379.06	
BENEFIT/COST	G2	A	C	D	G4S	E	B	B	THRIE	G4W	G3	G1
VALUES	.31	.28	.24	.19	.19	.18	.18	.16	.16	.08	.03	

-8	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	THRIE	G4S	D	C	E	G3	B	E	G4W	G1
VALUES	38.51	48.25	49.25	50.02	52.89	55.05	56.32	60.03	65.58	65.71	176.49	
TOTAL COST	G2	G1	A	C	B	E	D	D	G4S	G4W	THRIE	G3
VALUES	441.99	454.97	466.73	523.53	634.06	638.51	646.36	668.50	684.19	767.73	1374.79	
BENEFIT/COST	G2	A	C	D	G4S	E	B	B	THRIE	G4W	G3	G1
VALUES	.33	.29	.25	.20	.19	.19	.18	.17	.17	.09	.02	

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 12-FT SHOULDER

4R-12-6

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 18 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 149.56

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	D	G4S	THRIE	A	E	C	G3	B	G4W	G1
	VALUES	36.44	61.82	62.16	64.98	64.87	70.92	77.67	78.10	83.27	83.41	127.09
	TOTAL COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
	VALUES	405.56	439.91	488.35	546.15	649.40	651.74	655.29	680.63	701.89	783.45	1396.58
	BENEFIT/COST	G2	A	C	D	G4S	E	THRIE	B	G4W	G1	G3
	VALUES	.28	.19	.15	.15	.14	.14	.12	.12	.11	.08	.05

8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	D	G4S	THRIE	A	E	C	G3	B	G4W	G1
	VALUES	34.94	60.56	60.76	64.05	68.23	68.69	75.94	76.60	81.69	81.83	126.57
	TOTAL COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
	VALUES	405.04	438.42	486.70	544.41	647.17	650.17	654.04	679.24	700.31	782.53	1396.08
	BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G1	G3
	VALUES	.28	.19	.16	.15	.14	.14	.12	.12	.11	.08	.06

A.218

6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	D	G4S	THRIE	A	E	C	G3	B	G4W	G1
	VALUES	33.54	59.44	59.47	63.01	66.57	66.67	74.06	75.09	79.99	80.13	125.95
	TOTAL COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
	VALUES	404.43	437.02	485.15	542.54	645.05	648.46	652.91	677.95	698.61	781.49	1393.57
	BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G1	G3
	VALUES	.29	.20	.16	.15	.15	.14	.12	.12	.11	.08	.06

4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	E	A	C	G3	B	G4W	G1
	VALUES	32.24	58.27	58.42	61.82	64.57	65.15	72.02	73.52	78.15	78.29	125.21
	TOTAL COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
	VALUES	403.69	435.72	483.63	540.50	643.05	646.62	651.89	676.74	696.76	780.29	1391.99
	BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G1	G3
	VALUES	.29	.20	.17	.15	.15	.15	.13	.12	.12	.09	.06

2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	E	A	C	G3	B	G4W	G1
	VALUES	31.01	57.08	57.46	60.43	62.67	63.57	69.80	71.79	76.15	76.29	124.31
	TOTAL COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
	VALUES	402.78	434.48	482.04	538.28	641.15	644.62	650.93	675.55	694.76	778.91	1390.27
	BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G1	G3
	VALUES	.29	.21	.17	.16	.15	.15	.13	.12	.12	.09	.06

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 12-FT SHOULDER

4R-12-6

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 18 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 149,56
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

0 STATE COST G1 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 VALUES G2 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST G4S 29.79 55.81 56.48 58.82 60.81 61.75 62.37 64.79 64.79 74.10 123.18
 VALUES G1 29.79 55.81 56.48 58.82 60.81 61.75 62.37 64.79 64.79 74.10 123.18
 TOTAL COST G2 401.65 433.26 480.23 535.84 639.29 642.44 645.96 674.28 674.28 772.29 1388.27
 VALUES G1 401.65 433.26 480.23 535.84 639.29 642.44 645.96 674.28 674.28 772.29 1388.27
 BENEFIT/COST G2 .30 .21 .18 .16 .15 .15 .13 .12 .12 .09 .06
 VALUES G1 .30 .21 .18 .16 .15 .15 .13 .12 .12 .09 .06

-2 STATE COST G1 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 VALUES G2 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST G4S 28.53 54.33 55.38 58.89 58.93 59.50 64.66 67.36 67.36 71.56 121.75
 VALUES G1 28.53 54.33 55.38 58.89 58.93 59.50 64.66 67.36 67.36 71.56 121.75
 TOTAL COST G2 400.23 432.00 477.97 533.13 637.41 640.03 648.86 672.80 672.80 775.37 1385.83
 VALUES G1 400.23 432.00 477.97 533.13 637.41 640.03 648.86 672.80 672.80 775.37 1385.83
 BENEFIT/COST G2 .30 .22 .18 .16 .16 .15 .14 .13 .13 .10 .06
 VALUES G1 .30 .22 .18 .16 .16 .15 .14 .13 .13 .10 .06

A.219

-4 STATE COST G1 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 VALUES G2 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST G4S 27.17 52.52 54.06 54.58 56.61 56.96 61.61 64.32 64.32 69.01 119.93
 VALUES G1 27.17 52.52 54.06 54.58 56.61 56.96 61.61 64.32 64.32 69.01 119.93
 TOTAL COST G2 398.41 430.64 475.08 530.08 635.44 637.35 647.54 670.99 670.99 773.05 1382.80
 VALUES G1 398.41 430.64 475.08 530.08 635.44 637.35 647.54 670.99 670.99 773.05 1382.80
 BENEFIT/COST G2 .30 .22 .19 .16 .16 .16 .14 .13 .13 .11 .06
 VALUES G1 .30 .22 .19 .16 .16 .16 .14 .13 .13 .11 .06

-6 STATE COST G1 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 VALUES G2 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST G4S 25.68 50.30 51.80 52.47 52.96 54.88 58.18 60.59 60.59 66.01 117.64
 VALUES G1 25.68 50.30 51.80 52.47 52.96 54.88 58.18 60.59 60.59 66.01 117.64
 TOTAL COST G2 396.11 429.16 471.44 526.65 633.36 634.36 645.94 668.77 668.77 770.28 1379.06
 VALUES G1 396.11 429.16 471.44 526.65 633.36 634.36 645.94 668.77 668.77 770.28 1379.06
 BENEFIT/COST G2 .31 .23 .20 .16 .16 .16 .15 .14 .14 .11 .07
 VALUES G1 .31 .23 .20 .16 .16 .16 .15 .14 .14 .11 .07

-8 STATE COST G1 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 VALUES G2 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST G4S 24.12 47.26 48.66 48.78 50.65 52.76 54.49 56.32 56.32 62.80 114.86
 VALUES G1 24.12 47.26 48.66 48.78 50.65 52.76 54.49 56.32 56.32 62.80 114.86
 TOTAL COST G2 393.33 427.60 467.26 522.96 631.14 631.24 644.13 666.24 666.24 767.13 1374.79
 VALUES G1 393.33 427.60 467.26 522.96 631.14 631.24 644.13 666.24 666.24 767.13 1374.79
 BENEFIT/COST G2 .31 .24 .20 .17 .17 .17 .15 .14 .14 .12 .07
 VALUES G1 .31 .24 .20 .17 .17 .17 .15 .14 .14 .12 .07

4R-12-8

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 12-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 20 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 132.26

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

10	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	D	G4S	THRIE	E	A	G3	C	B	G1	G4W
	VALUES	30.69	58.64	59.09	64.98	66.93	68.69	72.93	78.80	82.10	82.18	82.25
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	360.65	434.16	487.16	547.27	645.41	650.58	652.12	672.56	700.72	783.45	1391.40
	BENEFIT/COST	G2	G1	A	D	G4S	C	E	THRIE	B	G4W	G3
	VALUES	.25	.18	.15	.12	.12	.11	.11	.09	.09	.08	.04

8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	D	G4S	THRIE	E	A	G3	C	G1	B	G4W
	VALUES	29.49	57.79	58.08	64.05	65.23	67.22	71.66	76.89	79.15	80.70	80.85
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	357.63	432.97	485.70	545.37	643.71	649.18	651.27	676.56	699.32	782.53	1390.13
	BENEFIT/COST	G2	G1	A	D	G4S	C	E	THRIE	B	G4W	G3
	VALUES	.25	.19	.16	.13	.12	.12	.12	.09	.09	.08	.05

6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	D	G4S	THRIE	E	A	G3	C	G1	B	G4W
	VALUES	28.40	56.96	57.09	63.01	63.57	65.86	70.38	74.83	75.94	79.19	79.33
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	354.42	431.87	484.33	543.31	642.05	647.66	650.44	675.56	697.80	781.49	1388.85
	BENEFIT/COST	G2	G1	A	D	G4S	C	E	THRIE	B	G4W	G3
	VALUES	.26	.20	.16	.13	.12	.12	.12	.10	.09	.09	.05

4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	G1	C	B	G4W
	VALUES	27.41	56.08	56.15	61.82	61.94	64.53	64.05	72.49	72.62	77.53	77.67
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	350.97	430.89	483.01	541.09	640.42	646.01	649.63	674.56	696.15	780.29	1387.52
	BENEFIT/COST	G2	G1	A	D	G4S	C	E	THRIE	B	G4W	G3
	VALUES	.26	.21	.16	.13	.13	.12	.12	.10	.10	.09	.05

2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	G1	C	B	G4W
	VALUES	26.50	55.03	55.34	60.35	60.43	63.13	67.58	68.75	70.22	75.22	75.86
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	347.23	429.98	481.60	538.70	638.82	644.19	648.81	673.51	694.33	778.91	1386.05
	BENEFIT/COST	G2	G1	A	D	G4S	C	E	THRIE	B	G4W	G3
	VALUES	.26	.23	.17	.13	.13	.12	.12	.10	.10	.09	.05

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 12-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 20 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 132.26

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE

1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
0	STATE COST	G1	G2	A	C	B	E	D	G4S	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	1318.48
SOCIETAL COST	G2	G4S	D	E	THRIE	A	G1	C	B	G4W
VALUES	25.63	53.89	54.49	58.77	58.82	61.48	64.63	65.86	67.62	73.84
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	343.10	429.10	479.95	536.10	637.24	642.17	647.97	672.36	692.31	1384.33
BENEFIT/COST	G2	G1	A	C	D	E	G4S	B	THRIE	G3
VALUES	.26	.24	.17	.14	.13	.13	.13	.10	.09	.05

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
-2	STATE COST	G1	G2	A	C	B	E	D	G4S	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G1	C	B	G4W
VALUES	24.73	52.59	53.58	56.89	57.18	59.36	61.48	63.73	64.79	71.56
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	338.46	428.21	477.83	533.26	635.66	639.90	647.05	671.07	690.04	1384.21
BENEFIT/COST	G2	G1	A	C	D	E	G4S	B	THRIE	G3
VALUES	.27	.26	.17	.14	.13	.13	.13	.10	.10	.05

A.221

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
-4	STATE COST	G1	G2	A	C	B	E	D	G4S	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	G1	E	A	G3	C	G4W
VALUES	23.76	51.06	52.56	54.58	54.68	55.56	56.55	61.04	61.66	68.96
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	333.16	427.24	475.03	530.13	634.04	637.30	646.03	669.54	687.44	1379.52
BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
VALUES	.28	.27	.18	.15	.13	.13	.13	.11	.10	.05

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
-6	STATE COST	G1	G2	A	C	B	E	D	G4S	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	1318.48
SOCIETAL COST	G2	G1	D	G4S	THRIE	A	E	G3	C	G4W
VALUES	22.69	48.66	49.26	51.39	51.80	52.95	53.91	57.70	58.19	66.00
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	327.13	426.17	471.43	526.66	632.39	634.34	644.87	667.73	684.48	1376.18
BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
VALUES	.30	.27	.19	.16	.14	.14	.13	.12	.11	.06

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
-8	STATE COST	G1	G2	A	C	B	E	D	G4S	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	1318.48
SOCIETAL COST	G2	G1	D	G4S	THRIE	A	E	G3	C	G4W
VALUES	21.58	42.23	47.22	48.66	48.78	50.08	52.25	53.86	54.49	62.80
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	320.71	425.06	467.26	522.96	630.73	631.14	643.56	665.69	681.27	1372.34
BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE	G3
VALUES	.32	.27	.20	.17	.14	.14	.14	.12	.11	.06

4R-12-8

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 12-FT SHOULDER

4R-12-10

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 22 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 117.56
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	D	G4S	THRIE	E	A	G3	C	B	G4W
VALUES	27.35	56.64	57.43	57.90	64.98	66.93	68.69	72.93	78.80	82.10	82.25
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	335.11	430.82	487.16	547.27	645.41	650.58	650.91	676.38	700.72	783.45	1391.40
BENEFIT/COST	G2	G1	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.22	.22	.12	.10	.10	.09	.08	.07	.06	.06	.03

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	D	G4S	THRIE	E	A	G3	C	B	G4W
VALUES	26.58	53.52	56.77	57.08	64.05	65.23	67.22	71.66	76.84	80.70	80.85
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	331.99	430.05	485.70	545.37	643.71	649.18	650.24	675.55	694.32	782.53	1390.13
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.23	.23	.12	.10	.10	.09	.09	.07	.06	.06	.03

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	D	G4S	THRIE	E	A	G3	C	B	G4W
VALUES	25.80	50.50	56.13	56.27	63.01	63.57	65.86	70.38	74.83	79.19	79.33
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	328.97	429.27	484.33	543.31	642.05	647.66	649.61	674.75	697.80	781.49	1388.85
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.24	.23	.12	.10	.10	.09	.09	.08	.07	.06	.04

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	D	G4S	THRIE	E	A	G3	C	B	G4W
VALUES	25.03	47.60	55.46	55.52	61.82	61.94	64.53	69.05	72.62	77.53	77.67
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	326.08	428.50	483.01	541.09	640.42	646.01	648.99	673.93	696.15	780.29	1387.52
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.25	.23	.13	.10	.10	.10	.10	.08	.07	.06	.04

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	D	G4S	THRIE	E	A	G3	C	B	G4W
VALUES	24.27	44.83	54.59	54.89	60.35	60.43	63.13	67.58	70.22	75.72	75.86
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	323.31	427.75	481.60	538.70	638.82	644.19	648.37	673.07	694.33	778.91	1386.05
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.26	.23	.13	.11	.10	.10	.10	.08	.07	.07	.04

A.222

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 12-FT SHOULDER

4R-12-10

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 22 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 117.56

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	E	THRIE	A	G3	C	B	G4W
	VALUES	23.54	42.17	53.62	54.22	58.77	58.82	61.48	65.86	67.62	73.70	73.84
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	320.65	427.01	479.95	536.10	637.24	642.17	647.69	672.09	692.31	772.29	1384.33
	BENEFIT/COST	G1	G2	A	D	C	G4S	E	THRIE	B	G4W	G3
	VALUES	.27	.23	.13	.11	.11	.10	.10	.08	.08	.07	.04

-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
	VALUES	22.84	39.58	52.45	53.44	56.89	57.18	59.36	63.73	64.79	71.42	71.56
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	318.06	426.31	477.83	533.26	635.66	639.90	646.91	670.93	690.04	775.37	1382.21
	BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
	VALUES	.28	.23	.14	.11	.11	.11	.10	.08	.08	.07	.04

A.223

-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
	VALUES	22.18	37.06	51.01	52.50	54.58	55.56	56.55	61.04	61.66	68.82	68.96
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	315.53	425.66	475.03	530.13	634.04	637.30	645.98	669.49	687.44	773.05	1379.52
	BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
	VALUES	.29	.24	.15	.12	.11	.11	.11	.09	.09	.08	.04

-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	A	E	G3	C	B	G4W
	VALUES	21.56	34.60	49.25	51.38	51.80	52.95	53.91	57.20	58.19	65.87	66.00
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	313.08	425.04	471.43	526.66	632.39	634.34	644.86	667.72	684.48	770.28	1376.18
	BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
	VALUES	.30	.24	.15	.13	.11	.11	.11	.09	.09	.08	.05

-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	A	E	G3	C	B	G4W
	VALUES	20.99	32.32	47.21	48.66	48.78	50.08	52.25	53.86	54.49	62.67	62.80
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	310.79	424.46	467.26	522.96	630.73	631.14	643.56	665.69	681.27	767.13	1372.34
	BENEFIT/COST	G1	G2	A	C	G4S	D	E	THRIE	B	G4W	G3
	VALUES	.31	.24	.16	.13	.11	.11	.11	.10	.10	.09	.05

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 12-FT SHOULDER

4R-12-12

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 24 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 105.09
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	D	G4S	THRIE	E	A	G3	C	B	G4W
VALUES	27.35	34.89	57.43	57.90	64.98	66.93	68.69	69.69	78.80	82.10	82.25
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	313.36	430.82	487.16	547.27	645.41	650.58	650.91	676.38	700.72	783.45	1388.17
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.25	.19	.09	.08	.08	.07	.06	.06	.04	.04	.03
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	D	G4S	THRIE	E	A	G3	C	B	G4W
VALUES	26.58	33.73	56.77	57.08	64.05	65.23	67.22	68.84	76.89	80.70	80.85
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	312.21	430.05	485.70	545.37	643.71	649.18	650.24	675.55	699.32	782.53	1387.31
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.26	.19	.09	.08	.08	.07	.06	.06	.04	.04	.03
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	D	G4S	THRIE	E	A	G3	C	B	G4W
VALUES	25.80	32.70	56.13	56.27	63.01	63.57	65.86	67.86	74.83	79.19	79.33
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	311.18	429.27	484.33	543.31	642.05	647.66	649.61	674.75	697.80	781.49	1386.34
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.26	.20	.09	.08	.08	.07	.06	.06	.05	.04	.03
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	D	G4S	THRIE	E	A	G3	C	B	G4W
VALUES	25.03	31.78	55.46	55.52	61.82	61.94	64.53	66.74	72.62	77.53	77.67
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	310.25	428.50	483.01	541.09	640.42	646.01	648.99	673.93	696.15	780.29	1385.22
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.26	.20	.10	.08	.08	.07	.07	.06	.05	.04	.03
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	D	G4S	THRIE	E	A	G3	C	B	G4W
VALUES	24.27	30.92	54.59	54.89	60.35	60.43	63.13	65.42	70.22	75.72	75.86
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	309.40	427.75	481.60	538.70	638.82	644.19	648.37	673.07	694.33	778.91	1383.90
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.27	.20	.10	.08	.08	.08	.07	.06	.05	.05	.03

A.224

SUMMARY OF RESULTS

4-LANE RURAL ROAD WITH 12-FT SHOULDER

4R-12-12

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 24 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 105.09

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	A	G3	C	B	G4W
	VALUES	23.54	30.09	53.62	54.22	58.72	58.82	61.48	63.83	67.62	73.84
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	308.56	427.01	472.95	536.10	637.24	642.17	647.69	672.09	727.29	1382.31
	BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G3
	VALUES	.27	.20	.10	.09	.08	.08	.08	.06	.05	.03

-2	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	B	G4W
	VALUES	22.84	29.20	52.45	53.44	56.89	57.18	59.36	61.90	64.79	71.42
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	307.67	426.31	472.83	533.26	635.66	639.90	646.91	670.93	725.37	1380.37
	BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G3
	VALUES	.27	.20	.11	.09	.09	.09	.08	.07	.06	.03

A.225

-4	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	B	G4W
	VALUES	22.18	28.19	51.01	52.50	54.58	55.56	56.55	59.51	61.66	68.82
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	306.67	425.66	475.03	530.13	634.04	637.30	645.98	669.49	723.05	1377.49
	BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G3
	VALUES	.28	.21	.12	.09	.09	.09	.09	.07	.06	.03

-6	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	D	THRIE	A	E	G3	C	G4W
	VALUES	21.56	27.03	49.25	51.38	51.80	52.95	53.91	56.61	58.19	65.87
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	305.51	425.04	471.43	526.66	632.39	634.34	644.86	667.22	720.28	1375.08
	BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G3
	VALUES	.28	.21	.12	.10	.09	.09	.09	.07	.06	.04

-8	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	A	D	E	G3	C	G4W
	VALUES	20.99	25.77	47.21	48.66	48.78	50.08	52.25	53.29	54.49	62.67
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	304.24	424.46	467.26	522.96	630.73	631.14	643.56	665.69	718.13	1371.76
	BENEFIT/COST	G1	G2	A	C	G4S	D	E	THRIE	B	G3
	VALUES	.28	.21	.13	.11	.09	.09	.09	.07	.07	.04

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ EMBANKMENT HINGE AT 3 FT

D-3-0

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 3 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 163.87

ADOT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1 2 3 4 5 6 7 8 9 10 11

10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	THRIE	D	A	C	G3	B	G4W	G1
VALUES	56.49	68.11	71.96	73.97	74.41	77.00	77.64	82.05	94.72	94.95	193.64
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	459.97	472.12	495.47	546.12	650.44	663.20	667.89	686.59	713.43	792.45	1400.52
BENEFIT/COST	G2	A	C	E	G4S	D	THRIE	B	G4W	G3	G1
VALUES	.27	.21	.18	.16	.15	.15	.13	.12	.11	.06	.11

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	THRIE	D	A	C	G3	B	G4W	G1
VALUES	52.00	65.76	70.40	70.41	72.70	73.54	73.88	78.30	91.34	91.57	187.53
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	455.48	466.00	492.07	542.36	648.88	658.82	666.18	684.24	710.05	788.88	1396.78
BENEFIT/COST	G2	A	C	E	G4S	D	THRIE	B	G4W	G3	G1
VALUES	.28	.22	.19	.16	.16	.15	.13	.12	.06	.06	.08

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	THRIE	D	A	C	G3	B	G4W	G1
VALUES	47.51	63.28	65.73	68.72	69.99	70.07	70.86	74.93	87.84	88.07	180.88
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	450.98	459.35	488.54	538.47	647.20	656.32	664.34	681.76	706.55	785.20	1392.90
BENEFIT/COST	G2	A	C	E	G4S	D	THRIE	B	G4W	G3	G1
VALUES	.29	.22	.20	.16	.16	.16	.14	.13	.12	.07	.06

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	THRIE	D	A	C	G3	B	G4W	G1
VALUES	43.22	60.70	63.03	66.09	66.53	66.91	68.40	70.54	84.31	84.53	173.73
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	446.69	452.20	485.00	534.56	645.39	652.78	662.38	679.18	703.00	781.51	1389.02
BENEFIT/COST	G2	A	C	E	G4S	D	THRIE	B	G4W	G3	G1
VALUES	.30	.23	.21	.17	.17	.16	.14	.14	.13	.07	.04

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	THRIE	D	A	C	G3	B	G4W	G1
VALUES	39.39	58.08	59.47	62.30	63.10	64.98	66.78	66.83	80.84	81.06	166.13
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	442.87	444.60	481.57	530.78	643.45	649.32	660.30	676.55	699.54	777.45	1385.26
BENEFIT/COST	G2	A	C	E	G4S	D	THRIE	B	G4W	G3	G1
VALUES	.31	.24	.22	.17	.17	.16	.15	.15	.13	.07	.01

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ EMBANKMENT HINGE AT 3 FT

D-3-0

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 3 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 163.87

ADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	C	A	E	G3	D	B	G4W	G1
VALUES	36.29	55.46	56.17	58.78	59.93	62.92	63.29	64.66	72.58	77.80	158.17
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	436.64	439.77	478.41	527.25	641.39	646.06	658.13	673.93	696.27	774.65	1381.77
BENEFIT/COST	G2	A	C	G4S	E	D	B	THRIE	G4W	G3	G1
VALUES	.32	.25	.22	.18	.17	.17	.15	.15	.14	.08	.02

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	C	A	E	G3	D	B	G4W	G1
VALUES	34.09	52.90	53.24	55.62	57.12	60.18	60.76	62.42	74.60	74.81	149.97
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	428.44	437.56	475.60	524.10	639.24	643.08	655.90	671.38	693.29	771.72	1378.66
BENEFIT/COST	G2	A	C	G4S	E	D	B	THRIE	G4W	G3	G1
VALUES	.32	.26	.23	.18	.18	.17	.16	.15	.14	.08	.05

A.227

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	C	A	E	G3	D	B	G4W	G1
VALUES	32.73	50.43	50.69	52.84	54.67	57.45	58.54	60.16	71.93	72.13	141.64
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	420.12	436.20	473.15	521.32	637.01	640.40	653.63	668.91	690.61	769.16	1375.93
BENEFIT/COST	G2	A	C	G4S	E	D	B	THRIE	G4W	G3	G1
VALUES	.33	.26	.24	.19	.18	.17	.16	.15	.15	.08	.08

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	C	A	E	G3	D	B	G4W	G1
VALUES	31.93	48.05	48.41	50.34	52.49	55.02	56.30	57.90	69.48	69.68	133.36
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	411.83	435.41	470.96	518.82	634.78	637.96	651.38	666.53	688.16	766.88	1373.49
BENEFIT/COST	G2	A	C	G4S	E	D	B	THRIE	G4W	G1	G3
VALUES	.33	.27	.24	.19	.19	.18	.17	.16	.15	.11	.08

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	C	A	E	G3	D	B	G4W	G1
VALUES	31.36	45.79	46.31	48.03	50.47	52.76	54.14	55.73	67.20	67.40	125.36
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	403.83	434.84	468.95	516.51	632.61	635.68	649.20	664.27	685.88	764.78	1371.24
BENEFIT/COST	G2	A	C	G4S	E	D	B	THRIE	G4W	G1	G3
VALUES	.33	.27	.25	.19	.19	.18	.17	.16	.16	.14	.08

D-3-2

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 3-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 5 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 388.18

AA DT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	D	G3	G4S	F	G2	A	G4W	G1
VALUES	74.01	94.02	95.29	98.70	148.85	154.90	155.11	156.12	172.89	405.10
TOTAL COST	G2	C	A	G1	D	E	B	G4S	THRIE	G3
VALUES	558.59	562.49	574.59	683.57	688.76	733.38	741.13	767.33	792.49	1417.17
BENEFIT/COST	C	G2	A	D	THRIE	E	G4S	B	G3	G1
VALUES	.63	.58	.55	.49	.44	.40	.39	.38	.22	-.06

8 STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	D	G3	G4S	G2	E	A	G4W	G1
VALUES	70.43	87.01	89.44	91.65	139.49	143.69	146.21	146.49	162.52	405.06
TOTAL COST	G2	C	A	D	G1	E	H	G4S	THRIE	G3
VALUES	547.17	555.48	564.96	682.92	683.53	724.69	730.99	757.97	788.90	1410.13
BENEFIT/COST	C	G2	A	D	THRIE	E	G4S	B	G3	G1
VALUES	.64	.61	.58	.50	.44	.42	.40	.36	.22	-.06

6 STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	D	G3	G4S	G2	A	E	G4W	G1
VALUES	66.73	79.90	83.50	84.50	129.60	131.77	136.32	136.99	151.87	405.01
TOTAL COST	G2	C	A	D	G1	E	B	G4S	THRIE	G3
VALUES	535.25	548.38	554.79	676.98	683.49	715.46	720.35	748.08	785.21	1402.98
BENEFIT/COST	C	G2	A	D	THRIE	E	G4S	B	G3	G1
VALUES	.66	.64	.60	.51	.45	.43	.42	.38	.23	-.06

4 STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	D	G3	G4S	G2	A	E	G4W	G1
VALUES	63.04	72.96	77.53	77.67	119.37	119.59	125.80	127.37	140.95	404.96
TOTAL COST	G2	C	A	D	G1	E	B	G4S	THRIE	G3
VALUES	523.07	541.44	544.28	671.14	683.43	705.85	709.42	737.85	781.51	1396.01
BENEFIT/COST	C	G2	A	D	THRIE	E	B	G4S	G3	G1
VALUES	.67	.67	.63	.52	.45	.45	.43	.40	.24	-.06

2 STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	D	G3	G4S	G2	A	E	G4W	G1
VALUES	59.47	66.53	71.08	72.22	107.49	109.05	115.21	117.56	130.06	404.89
TOTAL COST	G2	A	C	D	G1	E	B	G4S	THRIE	G3
VALUES	510.97	533.69	535.01	665.70	683.37	696.04	698.53	727.52	777.95	1389.56
BENEFIT/COST	G2	C	A	D	E	THRIE	B	G4S	G3	G1
VALUES	.70	.69	.65	.53	.47	.46	.45	.42	.24	-.06

A.228

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 3-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 5 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 388.18
 ADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11
 PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0 STATE COST
 VALUES G1 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48 G3
 SOCIETAL COST THRIE C G3 D G2 G4S A E B G4W G4S THRIE G3
 VALUES 56.17 60.96 65.52 67.45 95.82 98.91 104.86 107.80 119.53 119.75 404.81 G1
 TOTAL COST G2 A C D E G1 G4S G4W THRIE G3
 VALUES 499.30 523.34 529.44 660.93 683.24 686.27 688.01 717.39 738.22 774.65 1383.99 G3
 BENEFIT/COST G2 C A D E B G4S THRIE G4W G3 G1
 VALUES .72 .70 .68 .54 .48 .47 .47 .46 .43 .24 -.06

-2 STATE COST
 VALUES G1 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48 G3
 SOCIETAL COST THRIE C G3 D G2 G4S A E B G4W G4S THRIE G3
 VALUES 53.24 56.49 61.06 63.53 84.87 89.19 94.99 98.28 109.64 109.85 404.71 G1
 TOTAL COST G2 A C D E B G1 G4S G4W THRIE G3
 VALUES 488.35 513.46 524.96 657.01 676.75 678.12 681.18 707.67 728.33 771.72 1379.54 G3
 BENEFIT/COST G2 C A D E B G4S THRIE G4W G3 G1
 VALUES .75 .71 .70 .55 .50 .49 .48 .47 .45 .25 -.06

A.229

-4 STATE COST
 VALUES G1 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48 G3
 SOCIETAL COST THRIE C G3 D G2 G4S A E B G4W G4S THRIE G3
 VALUES 50.69 53.07 57.68 60.44 74.71 79.98 85.68 89.10 100.46 100.66 404.58 G1
 TOTAL COST G2 A C D E B G1 G4S G4W THRIE G3
 VALUES 478.19 504.15 521.54 653.92 667.58 668.93 683.06 698.46 719.14 769.16 1376.16 G3
 BENEFIT/COST G2 A C D E B G4S THRIE G4W G3 G1
 VALUES .78 .72 .72 .55 .52 .51 .50 .47 .46 .25 -.06

-6 STATE COST
 VALUES G1 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48 G3
 SOCIETAL COST THRIE C G3 D G2 G4S A E B G4W G4S THRIE G3
 VALUES 48.41 50.37 55.05 57.94 65.22 71.23 76.85 80.27 91.85 92.06 404.44 G1
 TOTAL COST G2 A C D E B G1 G4S G4W THRIE G3
 VALUES 468.69 495.33 518.85 651.41 658.75 660.33 682.91 689.70 710.53 766.88 1373.52 G3
 BENEFIT/COST G2 A C D E B G4S THRIE G4W G3 G1
 VALUES .80 .74 .72 .56 .53 .52 .51 .48 .47 .25 -.06

-8 STATE COST
 VALUES G1 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48 G3
 SOCIETAL COST THRIE C G3 D G2 G4S A E B G4W G4S THRIE G3
 VALUES 46.31 48.03 52.77 55.73 56.29 62.93 68.50 71.86 83.75 83.95 404.26 G1
 TOTAL COST G2 A C D E B G1 G4S G4W THRIE G3
 VALUES 459.77 486.97 516.51 649.20 650.34 652.22 681.40 682.74 702.42 764.78 1371.24 G3
 BENEFIT/COST G2 A C D E B G4S THRIE G4W G3 G1
 VALUES .82 .76 .73 .56 .55 .54 .53 .49 .48 .25 -.06

D-3-2

D-3-4

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 3-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 7 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 334.61
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

10	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	D	A	C	G3	B	G4W	G1	G1
VALUES	56.49	68.11	72.00	73.97	74.41	77.00	77.64	82.05	94.72	94.95	285.98	285.98
TOTAL COST	G2	A	C	G1	E	B	D	G4S	G4W	THRIE	G3	G3
VALUES	459.47	445.47	546.12	564.46	650.48	663.20	667.89	686.59	713.43	792.45	1400.52	1400.52
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1	G1
VALUES	.69	.62	.55	.45	.44	.43	.42	.39	.36	.19	.17	.17

8	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	C	G3	B	G4W	G1	G1
VALUES	52.00	65.76	70.41	70.42	72.70	73.59	73.88	78.30	91.34	91.57	283.47	283.47
TOTAL COST	G2	A	C	G1	E	B	D	G4S	G4W	THRIE	G3	G3
VALUES	455.48	492.07	542.36	561.95	648.90	659.82	666.18	684.24	710.05	788.88	1396.78	1396.78
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1	G1
VALUES	.70	.62	.56	.46	.44	.43	.43	.39	.37	.19	.18	.18

A.230

6	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	C	G3	B	G4W	G1	G1
VALUES	47.51	63.28	66.73	68.73	69.99	70.07	70.86	74.43	87.84	88.07	280.84	280.84
TOTAL COST	G2	A	C	G1	E	B	D	G4S	G4W	THRIE	G3	G3
VALUES	450.48	488.54	538.47	559.31	647.21	656.32	664.34	681.76	706.55	785.20	1392.90	1392.90
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1	G1
VALUES	.71	.63	.56	.46	.44	.44	.43	.40	.37	.20	.19	.19

4	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	C	A	E	D	B	G4W	G1	G1
VALUES	43.22	60.70	63.03	66.09	66.53	66.92	68.90	70.54	84.31	84.53	278.07	278.07
TOTAL COST	G2	A	C	G1	E	B	D	G4S	G4W	THRIE	G3	G3
VALUES	446.69	485.00	534.56	556.54	645.39	652.78	662.38	679.18	703.00	781.51	1389.02	1389.02
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1	G3	G3
VALUES	.72	.64	.57	.46	.45	.44	.44	.40	.38	.20	.20	.20

2	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	C	A	E	G3	B	G4W	G1	G1
VALUES	39.39	58.08	59.47	62.30	63.10	64.98	66.78	66.83	80.84	81.06	275.17	275.17
TOTAL COST	G2	A	C	G1	E	B	D	G4S	G4W	THRIE	G3	G3
VALUES	442.87	481.57	530.78	553.65	643.45	649.32	660.30	676.55	699.54	777.95	1385.26	1385.26
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1	G3	G3
VALUES	.73	.65	.58	.47	.45	.45	.45	.41	.38	.21	.20	.20

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 3-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 7 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 334.61
 ADOT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
STATE COST	G1	G2	A	C	R	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	C	A	E	G3	D	B	G4W	G1
VALUES	36.29	55.46	56.17	58.78	59.93	62.92	63.29	64.66	77.58	77.80	272.15
TOTAL COST	G2	A	C	G1	E	R	D	G4S	G4W	THRIE	G3
VALUES	439.77	478.41	527.25	550.62	641.39	646.06	658.13	673.93	696.27	774.65	1381.77
BENEFIT/COST	G2	A	C	E	D	R	G4S	G4W	THRIE	G1	G3
VALUES	.74	.66	.59	.47	.45	.45	.45	.42	.39	.22	.21
-2											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	C	A	G3	E	D	B	G4W	G1
VALUES	34.09	52.90	53.24	55.62	57.12	60.18	60.76	62.42	74.60	74.81	269.02
TOTAL COST	G2	A	C	G1	E	B	D	G4S	G4W	THRIE	G3
VALUES	437.56	475.60	524.10	547.50	639.24	643.08	655.90	671.38	693.29	771.72	1376.66
BENEFIT/COST	G2	A	C	E	D	B	G4S	G4W	THRIE	G1	G3
VALUES	.74	.66	.60	.47	.46	.46	.46	.42	.39	.24	.21
-4											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	C	A	G3	E	D	B	G4W	G1
VALUES	32.73	50.43	50.69	52.84	54.67	57.45	58.54	60.16	71.93	72.13	265.85
TOTAL COST	G2	A	C	G1	E	B	D	G4S	G4W	THRIE	G3
VALUES	436.20	473.15	521.32	544.32	637.01	640.40	653.63	668.91	690.61	769.16	1375.93
BENEFIT/COST	G2	A	C	E	D	B	G4S	G4W	THRIE	G1	G3
VALUES	.75	.67	.60	.48	.46	.46	.46	.42	.40	.25	.21
-6											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	C	A	G3	E	D	B	G4W	G1
VALUES	31.93	48.05	48.41	50.34	52.49	55.02	56.30	57.90	69.48	69.68	262.69
TOTAL COST	G2	A	C	G1	E	B	D	G4S	G4W	THRIE	G3
VALUES	435.41	470.96	518.92	541.17	634.78	637.96	651.38	666.53	688.16	766.88	1373.49
BENEFIT/COST	G2	A	C	E	B	D	G4S	G4W	THRIE	G1	G3
VALUES	.75	.67	.61	.48	.47	.47	.46	.43	.40	.26	.21
-8											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	C	A	G3	E	D	B	G4W	G1
VALUES	31.36	45.79	46.31	48.03	50.47	52.76	54.14	55.73	67.20	67.40	259.67
TOTAL COST	G2	A	C	G1	E	B	D	G4S	G4W	THRIE	G3
VALUES	434.84	468.95	516.51	538.14	632.61	635.68	649.20	664.27	685.88	764.78	1371.24
BENEFIT/COST	G2	A	C	E	B	D	G4S	G4W	THRIE	G1	G3
VALUES	.75	.68	.61	.48	.47	.47	.47	.43	.40	.27	.21

A.231

D-3-4

D-3-6

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 3-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 9 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 288.60
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	THRIE	D	A	C	G3	B	G4W	G1
VALUES	35.90	68.11	71.96	73.97	74.41	77.00	77.64	82.05	94.72	94.95	193.62
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	439.37	472.10	495.47	546.12	650.44	663.20	667.89	686.59	713.43	792.45	1400.52
BENEFIT/COST	G2	A	C	E	D	G4S	G1	B	G4W	THRIE	G3
VALUES	.63	.51	.45	.37	.36	.36	.34	.34	.31	.30	.16

8	STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	E	THRIE	D	A	C	B	G4W	G1
	VALUES	35.49	65.76	70.40	70.41	72.70	73.59	73.88	78.30	91.34	187.52
	TOTAL COST	G2	G1	A	C	E	B	D	G4S	THRIE	G3
	VALUES	438.96	465.99	492.07	542.36	648.88	659.82	666.18	710.05	788.88	1396.78
	BENEFIT/COST	G2	A	C	E	D	G1	G4S	B	THRIE	G3
	VALUES	.63	.51	.46	.38	.36	.36	.36	.35	.30	.16

6	STATE COST	G1	G2	A	C	H	E	D	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	E	C	A	D	B	G4W	G1
	VALUES	35.04	63.28	66.73	68.72	69.99	70.07	70.86	74.43	87.84	180.87
	TOTAL COST	G2	G1	A	C	E	B	D	G4S	THRIE	G3
	VALUES	438.52	459.35	488.54	538.47	647.20	656.32	664.34	706.55	785.20	1392.90
	BENEFIT/COST	G2	A	C	G1	E	D	G4S	B	THRIE	G3
	VALUES	.63	.52	.47	.39	.38	.37	.36	.35	.31	.16

4	STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	C	A	E	D	B	G4W	G1
	VALUES	34.57	60.70	63.03	66.09	66.53	66.91	68.90	70.54	84.31	173.72
	TOTAL COST	G2	G1	A	C	E	B	D	G4S	THRIE	G3
	VALUES	438.04	452.20	485.00	534.56	645.39	652.78	662.38	703.00	781.51	1389.02
	BENEFIT/COST	G2	A	C	G1	E	D	G4S	B	THRIE	G3
	VALUES	.63	.53	.47	.41	.38	.37	.37	.36	.31	.17

2	STATE COST	G1	G2	A	C	H	E	D	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	C	A	E	G3	D	B	G1
	VALUES	34.07	58.08	59.47	62.30	63.10	64.98	66.78	66.83	81.06	166.12
	TOTAL COST	G2	G1	A	C	E	B	D	G4S	THRIE	G3
	VALUES	437.54	444.60	481.57	530.78	643.45	649.32	660.30	676.55	777.95	1385.26
	BENEFIT/COST	G2	A	C	G1	E	D	G4S	B	THRIE	G3
	VALUES	.63	.54	.48	.44	.39	.37	.37	.37	.32	.17

A.232

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 3-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 9 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 288,60

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE

		PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
		1	2	3	4	5	6	7	8	9	10	11
0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	C	A	E	G3	D	B	G4W	G1
	VALUES	33.54	55.46	56.17	58.78	59.93	62.92	63.29	64.66	77.58	77.80	158.17
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
BENEFIT/COST	VALUES	436.64	437.01	478.41	527.25	641.39	646.06	658.13	673.93	696.27	724.65	1381.77
		G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
	VALUES	.63	.55	.49	.47	.39	.38	.38	.37	.34	.32	.17

-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	C	A	G3	E	D	B	G4W	G1
	VALUES	32.99	52.90	53.24	55.62	57.12	60.18	60.76	62.42	74.60	74.81	149.97
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
BENEFIT/COST	VALUES	428.44	436.47	475.60	524.10	639.24	643.08	655.90	671.38	693.29	721.72	1378.66
		G2	A	G1	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	.63	.55	.50	.50	.39	.38	.38	.38	.35	.33	.17

A.233

-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	C	A	G3	E	D	B	G4W	G1
	VALUES	32.44	50.43	50.69	52.84	54.67	57.45	58.54	60.16	71.93	72.13	141.64
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
BENEFIT/COST	VALUES	420.12	435.92	473.15	521.32	637.01	640.40	653.63	668.91	690.61	769.16	1375.93
		G2	A	G1	C	E	G4S	D	B	G4W	THRIE	G3
	VALUES	.63	.56	.53	.50	.40	.39	.38	.38	.35	.33	.18

-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	C	A	G3	E	D	B	G4W	G1
	VALUES	31.89	48.05	48.41	50.34	52.49	55.02	56.30	57.90	69.48	69.68	133.36
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
BENEFIT/COST	VALUES	411.83	435.37	470.96	518.82	634.78	637.96	651.38	666.53	688.16	766.88	1373.49
		G2	A	G1	C	E	G4S	D	B	G4W	THRIE	G3
	VALUES	.64	.56	.56	.51	.40	.39	.39	.39	.35	.33	.18

-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	C	A	G3	E	D	B	G4W	G1
	VALUES	31.36	45.79	46.31	48.03	50.47	52.76	54.14	55.73	67.20	67.40	125.36
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
BENEFIT/COST	VALUES	403.83	434.84	468.95	516.51	632.61	635.68	649.20	664.27	685.88	764.78	1371.24
		G2	G1	A	C	E	G4S	D	B	G4W	THRIE	G3
	VALUES	.64	.59	.57	.51	.41	.39	.39	.39	.36	.34	.18

D-3-6

D-3-8

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 3-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 11 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 249.24
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10	1	2	3	4	5	6	7	8	9	10	11
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	E	THRIE	D	A	C	G3	B	G4W
VALUES	35.40	60.59	68.11	71.96	73.97	74.41	77.00	77.64	82.05	94.72	94.95
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	339.07	439.37	495.47	546.12	650.44	653.20	667.89	686.59	713.43	792.45	1400.52
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	.68	.53	.41	.37	.31	.29	.24	.27	.25	.24	.13
8	STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	E	THRIE	D	A	C	G3	B	G4W
VALUES	35.44	56.28	65.76	70.40	70.41	72.70	73.59	73.88	78.30	91.34	91.57
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	334.75	438.96	492.07	542.36	648.88	659.82	666.18	684.24	710.05	788.88	1346.78
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	.69	.53	.42	.37	.31	.30	.30	.28	.25	.25	.13
6	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	E	THRIE	C	A	D	G3	B	G4W
VALUES	35.04	51.98	63.28	66.73	68.72	69.99	70.07	70.86	74.43	87.84	88.07
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	330.45	438.52	488.54	538.47	647.20	656.32	664.34	681.76	706.55	785.20	1392.90
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
VALUES	.71	.53	.43	.38	.31	.30	.30	.28	.26	.25	.13
4	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	E	THRIE	C	A	D	G3	B	G4W
VALUES	34.57	47.89	60.70	63.03	66.09	66.53	66.91	68.90	70.54	84.31	84.53
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	326.37	438.04	485.00	534.56	645.59	652.78	662.38	679.18	703.00	781.51	1389.02
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
VALUES	.72	.53	.44	.39	.32	.30	.30	.29	.27	.26	.14
2	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	E	THRIE	C	A	F	D	B	G4W
VALUES	34.07	44.29	58.08	59.47	62.30	63.10	64.98	66.78	66.83	80.84	81.06
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	322.76	437.54	481.57	530.78	643.45	649.32	660.30	676.55	699.54	777.95	1385.26
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
VALUES	.74	.53	.44	.40	.32	.31	.31	.30	.27	.26	.14

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 3-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 11 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 249.24

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

0	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G1	G2	G4S	THRIE	C	A	E	G3	D	D	B	G4W
	VALUES	33.54	41.42	55.46	56.17	58.78	59.93	62.92	63.29	64.66	64.66	77.58	77.80
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	G4W	THRIE	G3
	VALUES	314.90	437.01	478.41	527.25	641.34	646.06	658.13	673.93	696.27	696.27	774.65	1381.77
	BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	G4W	THRIE	G3
	VALUES	.75	.53	.45	.41	.32	.31	.31	.30	.28	.28	.27	.14

-2	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	C	A	E	G3	E	D	B	G4W
	VALUES	32.99	39.46	52.90	53.24	55.62	57.12	60.18	60.76	62.42	62.42	74.60	74.81
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	G4W	THRIE	G3
	VALUES	317.94	436.47	475.60	524.10	639.24	643.08	655.90	671.38	693.29	693.29	771.72	1378.66
	BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	G4W	THRIE	G3
	VALUES	.75	.54	.46	.41	.33	.32	.31	.31	.28	.28	.27	.14

-4	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	C	A	E	G3	E	D	B	G4W
	VALUES	32.44	38.34	50.43	50.69	52.84	54.67	57.45	58.54	60.16	60.16	71.93	72.13
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	G4W	THRIE	G3
	VALUES	316.82	435.92	473.15	521.32	637.01	640.40	653.63	668.91	690.61	690.61	769.16	1375.93
	BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	G4W	THRIE	G3
	VALUES	.76	.54	.46	.42	.33	.32	.32	.31	.29	.29	.28	.15

-6	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	C	A	E	G3	E	D	B	G4W
	VALUES	31.89	37.78	48.05	48.41	50.34	52.49	55.02	56.30	57.90	57.90	69.48	69.68
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	G4W	THRIE	G3
	VALUES	316.26	435.37	470.96	518.82	634.78	637.96	651.38	666.53	688.16	688.16	766.88	1373.49
	BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	G4W	THRIE	G3
	VALUES	.76	.54	.47	.42	.33	.33	.32	.32	.29	.29	.28	.15

-8	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	THRIE	C	A	E	G3	E	D	B	G4W
	VALUES	31.36	37.45	45.79	46.31	48.03	50.47	52.76	54.14	55.73	55.73	67.20	67.40
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	G4W	THRIE	G3
	VALUES	315.93	434.84	468.95	516.51	632.61	635.68	649.20	664.27	685.88	685.88	764.78	1371.24
	BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	G4W	THRIE	G3
	VALUES	.76	.54	.47	.43	.34	.33	.33	.32	.29	.29	.28	.15

A.235

D-3-8

D-3-10

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 3-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 13 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 215.70
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	458.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G2	G4S	E	THRIE	D	A	C	G3	B	G4W
VALUES	35.90	39.77	68.11	71.96	73.97	74.41	77.00	77.64	82.05	94.72	94.95
TOTAL COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	318.24	439.37	495.47	530.44	650.44	663.20	667.89	686.59	713.43	792.45	1400.52
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
VALUES	.63	.45	.33	.29	.25	.24	.24	.21	.20	.20	.10
8	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	458.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G2	G4S	E	THRIE	D	A	C	G3	B	G4W
VALUES	35.49	39.56	65.76	70.40	70.41	72.70	73.59	73.88	78.30	91.34	91.57
TOTAL COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	318.04	438.96	492.07	532.36	648.88	659.82	666.18	684.24	710.05	788.88	1396.28
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
VALUES	.63	.45	.34	.30	.25	.24	.24	.22	.20	.20	.10
6	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	458.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G2	G4S	E	THRIE	D	A	C	G3	B	G4W
VALUES	35.04	39.35	63.28	64.73	68.72	69.99	70.07	70.86	74.43	87.84	88.07
TOTAL COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	317.83	438.52	488.54	538.47	647.20	656.32	664.34	681.26	706.55	785.20	1392.90
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
VALUES	.63	.45	.35	.31	.25	.25	.24	.22	.21	.21	.11
4	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	458.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G2	G4S	E	THRIE	D	A	C	G3	B	G4W
VALUES	34.57	39.13	60.70	63.03	66.09	66.53	66.91	68.90	70.54	84.31	84.53
TOTAL COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	317.61	438.04	485.00	534.56	645.39	652.78	662.38	679.18	703.00	781.51	1389.02
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
VALUES	.63	.45	.36	.32	.26	.25	.25	.23	.21	.21	.11
2	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	458.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G2	G4S	E	THRIE	D	A	C	G3	B	G4W
VALUES	34.07	38.89	58.08	59.47	62.30	63.10	64.98	66.78	68.83	80.84	81.06
TOTAL COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	317.37	437.54	481.57	530.78	643.45	649.32	660.30	676.55	699.54	777.95	1385.26
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
VALUES	.63	.45	.36	.33	.26	.25	.25	.24	.22	.22	.11

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 3-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 13 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 215.70
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	C	A	E	G3	D	B	G4W
VALUES	33.54	38.63	55.46	56.17	58.78	59.93	62.42	63.29	64.66	77.58	77.80
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	317.11	437.01	473.91	527.25	641.39	646.06	658.13	673.93	696.27	794.65	1381.77
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
VALUES	.64	.45	.37	.33	.26	.26	.25	.24	.22	.22	.12

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	C	A	G3	E	D	B	G4W
VALUES	32.44	38.35	52.90	53.24	55.62	57.12	60.18	60.76	62.42	74.60	74.81
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	316.83	436.47	475.60	524.10	639.24	643.08	655.90	671.38	693.29	771.72	1378.66
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
VALUES	.64	.45	.38	.34	.27	.26	.26	.25	.23	.23	.12

A.237

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	C	A	G3	E	D	B	G4W
VALUES	32.44	38.05	50.43	50.69	52.84	54.67	57.45	58.54	60.16	71.93	72.13
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	316.53	435.92	473.15	521.32	637.01	640.40	653.63	668.91	690.61	769.16	1375.93
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
VALUES	.64	.45	.38	.35	.27	.27	.26	.25	.23	.23	.12

-5 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	C	A	G3	E	D	B	G4W
VALUES	31.89	37.75	48.05	48.41	50.34	52.49	55.02	56.30	57.90	69.48	69.68
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	316.22	435.37	470.96	518.82	634.78	637.96	651.38	666.53	688.16	766.88	1373.49
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
VALUES	.64	.46	.39	.35	.28	.27	.27	.26	.24	.23	.12

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	C	A	G3	E	D	B	G4W
VALUES	31.36	37.45	45.79	46.31	48.03	50.47	52.76	54.14	55.73	67.20	67.40
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	315.93	434.84	468.95	516.51	632.61	635.68	649.20	664.27	685.88	764.78	1371.24
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
VALUES	.64	.46	.39	.36	.28	.27	.27	.26	.24	.24	.12

D-3-10

D-3-12

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 3-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 15 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 187.23
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

10	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	D	A	C	G3	B	G4W		
VALUES	35.90	39.71	68.11	71.96	73.97	74.41	77.00	77.64	82.05	94.72	94.95	
TOTAL COST	G1	G2	A	C	B	D	G4S	G4W	THRIE	G3		
VALUES	318.19	439.37	495.47	546.12	650.44	663.20	667.89	713.43	792.45	1400.52		
BENEFIT/COST	G1	G2	A	C	E	D	B	THRIE	G4W	G3		
VALUES	.53	.38	.26	.23	.20	.19	.16	.15	.16	.08		

8	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	D	A	C	G3	B	G4W		
VALUES	35.49	39.53	65.76	70.40	70.41	72.70	73.59	73.88	78.30	91.34	91.57	
TOTAL COST	G1	G2	A	C	E	D	G4S	G4W	THRIE	G3		
VALUES	318.01	438.96	492.07	542.36	648.88	659.82	666.18	710.05	788.88	1396.78		
BENEFIT/COST	G1	G2	A	C	E	D	B	THRIE	G4W	G3		
VALUES	.53	.38	.27	.24	.20	.20	.19	.17	.15	.08		

A.238

6	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	E	C	A	D	G3	B	G4W	
VALUES	35.04	39.34	63.28	66.73	68.72	69.99	70.07	70.86	74.43	87.84	88.07	
TOTAL COST	G1	G2	A	C	E	D	G4S	G4W	THRIE	G3		
VALUES	317.81	438.52	488.54	538.47	647.20	656.32	664.34	706.55	785.20	1392.90		
BENEFIT/COST	G1	G2	A	C	E	D	B	THRIE	G4W	G3		
VALUES	.53	.38	.28	.25	.20	.20	.20	.17	.16	.09		

4	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	C	A	E	D	G3	B	G4W	
VALUES	34.57	39.13	60.70	63.03	66.09	66.53	66.91	68.90	70.54	84.31	84.53	
TOTAL COST	G1	G2	A	C	E	D	G4S	G4W	THRIE	G3		
VALUES	317.60	438.04	485.00	534.56	645.39	652.78	662.38	703.00	781.51	1389.02		
BENEFIT/COST	G1	G2	A	C	E	D	B	THRIE	G4W	G3		
VALUES	.53	.38	.29	.26	.21	.20	.20	.17	.17	.09		

2	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	C	A	E	D	G3	B	G4W	
VALUES	34.07	38.89	58.08	59.47	62.30	63.10	64.98	66.78	66.83	80.84	81.06	
TOTAL COST	G1	G2	A	C	E	D	G4S	G4W	THRIE	G3		
VALUES	317.37	437.54	481.57	530.78	643.45	649.32	660.30	699.54	777.95	1385.26		
BENEFIT/COST	G1	G2	A	C	E	D	B	THRIE	G4W	G3		
VALUES	.53	.38	.30	.27	.21	.20	.20	.19	.17	.09		

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 3-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 15 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 187.23

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G1	G2	G4S	THRIE	C	A	E	D	B	G4W
	VALUES	33.54	38.63	55.46	56.17	58.78	59.93	62.92	63.29	64.66	72.80
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	317.11	437.01	478.41	527.25	641.39	646.06	658.13	673.93	774.65	1381.77
	BENEFIT/COST	G1	G2	A	C	E	G4S	D	THRIE	G4W	G3
	VALUES	.53	.38	.30	.27	.21	.21	.21	.19	.18	.09
-2	STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G1	G2	G4S	THRIE	C	A	E	D	B	G4W
	VALUES	32.99	38.35	52.90	53.24	55.62	57.12	60.18	60.76	62.42	74.81
	TOTAL COST	G1	G2	A	C	F	B	D	G4S	THRIE	G3
	VALUES	316.83	436.47	475.60	524.10	634.24	643.08	655.90	671.38	771.72	1378.66
	BENEFIT/COST	G1	G2	A	C	E	G4S	D	THRIE	G4W	G3
	VALUES	.53	.38	.31	.28	.22	.22	.21	.20	.19	.10
-4	STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G1	G2	G4S	THRIE	C	A	E	D	B	G4W
	VALUES	32.44	38.05	50.43	50.69	52.84	54.67	57.45	58.54	60.16	72.13
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	316.53	435.92	473.15	521.32	637.01	640.40	653.63	668.91	769.16	1375.93
	BENEFIT/COST	G1	G2	A	C	E	G4S	D	THRIE	G4W	G3
	VALUES	.54	.38	.32	.29	.22	.22	.21	.20	.19	.10
-6	STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G1	G2	G4S	THRIE	C	A	E	D	B	G4W
	VALUES	31.89	37.75	48.05	48.41	50.34	52.49	55.02	56.30	57.90	69.68
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	316.22	435.37	470.96	518.82	634.78	637.96	651.38	666.53	766.88	1373.49
	BENEFIT/COST	G1	G2	A	C	E	G4S	D	THRIE	G4W	G3
	VALUES	.54	.38	.32	.29	.23	.23	.22	.21	.19	.10
-8	STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G1	G2	G4S	THRIE	C	A	E	D	B	G4W
	VALUES	31.36	37.45	45.79	46.31	48.03	50.47	52.76	54.14	55.73	67.40
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	315.93	434.84	468.95	516.51	632.61	635.68	649.20	664.27	764.78	1371.24
	BENEFIT/COST	G1	G2	A	C	E	G4S	D	THRIE	G4W	G3
	VALUES	.54	.39	.33	.30	.23	.23	.22	.21	.19	.10

A.239

D-3-12

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ EMBANKMENT HINGE AT 4 FT

D-4-0

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 4 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 152.16

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	E	D	THRIE	A	C	G3	B	G4W	G1
	VALUES	62.20	20.89	72.49	75.40	78.67	79.90	82.76	85.63	97.77	98.00	196.52
	TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	465.68	474.99	498.38	551.24	651.47	666.25	668.87	683.37	716.48	797.15	1405.11
	BENEFIT/COST	G2	A	C	E	G4S	D	THRIE	B	G4W	G3	G1
	VALUES	.22	.17	.15	.14	.13	.13	.10	.10	.09	.05	-.16

8	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	E	D	THRIE	A	C	G3	B	G4W	G1
	VALUES	57.77	68.83	71.62	73.95	75.41	76.85	79.27	83.21	94.66	94.88	191.69
	TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	461.25	470.16	495.32	547.74	650.10	663.13	667.43	687.31	713.36	793.89	1401.68
	BENEFIT/COST	G2	A	C	E	G4S	D	THRIE	B	G4W	G3	G1
	VALUES	.23	.18	.16	.14	.13	.13	.11	.10	.09	.05	-.14

A.240

6	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	E	D	THRIE	A	C	G3	B	G4W	G1
	VALUES	53.05	66.58	70.16	71.87	72.37	73.52	75.50	79.49	91.30	91.52	186.30
	TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	456.53	464.77	491.99	543.98	648.63	659.78	665.84	685.06	710.00	790.34	1397.97
	BENEFIT/COST	G2	A	C	E	G4S	D	THRIE	B	G4W	G3	G1
	VALUES	.25	.19	.16	.14	.14	.13	.11	.11	.10	.06	-.12

4	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	E	A	D	C	G3	B	G4W	G1
	VALUES	48.17	64.16	68.10	68.57	69.96	70.63	71.52	75.54	87.74	87.46	180.31
	TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	451.64	458.78	488.44	539.99	647.05	656.22	664.11	682.63	706.44	786.58	1394.02
	BENEFIT/COST	G2	A	C	E	G4S	D	THRIE	B	G4W	G3	G1
	VALUES	.26	.20	.17	.14	.14	.14	.12	.11	.10	.06	-.10

2	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	A	E	C	D	G3	B	G4W	G1
	VALUES	43.33	61.58	64.22	66.29	66.84	67.41	68.74	71.46	84.04	84.27	173.71
	TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	446.81	452.19	483.76	535.89	645.32	652.53	662.22	680.05	702.75	782.69	1389.94
	BENEFIT/COST	G2	A	C	E	G4S	D	THRIE	B	G4W	G3	G1
	VALUES	.27	.21	.18	.15	.15	.14	.12	.12	.11	.06	-.08

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ EMBANKMENT HINGE AT 4 FT

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 4 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 152.16

ADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0	STATE COST	G1	G2	A	C	H	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	488.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	A	C	E	D	G3	B	G4W	G1
	VALUES	38.84	58.90	60.34	62.66	63.36	64.45	66.70	67.93	80.38	80.54	166.53
	TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	42.36	445.01	481.13	531.83	643.43	648.86	660.18	677.37	699.07	778.86	1385.90
	BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
	VALUES	.28	.21	.19	.15	.15	.14	.13	.13	.12	.06	-.05

-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	488.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	A	C	E	D	G3	B	G4W	G1
	VALUES	35.22	56.14	56.80	59.27	59.54	62.90	63.65	64.51	76.88	77.08	158.83
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	437.31	438.70	477.74	528.02	641.38	645.35	657.94	674.66	695.56	775.28	1382.12
	BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
	VALUES	.29	.22	.20	.16	.15	.15	.13	.13	.12	.07	-.02

A.241

-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	488.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	C	A	G3	E	D	B	G4W	G1
	VALUES	32.65	53.50	53.63	56.13	56.28	60.24	60.68	62.20	73.68	73.84	150.68
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	429.16	436.13	474.76	524.61	634.16	642.16	655.68	671.98	692.36	772.10	1378.76
	BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
	VALUES	.30	.23	.20	.16	.16	.15	.14	.14	.13	.07	.01

-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	488.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	C	A	G3	E	D	B	G4W	G1
	VALUES	31.16	50.86	50.87	53.14	53.71	57.36	58.31	59.28	70.81	71.01	142.15
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	420.62	434.64	472.14	521.62	636.74	639.28	653.26	664.34	684.48	764.35	1375.83
	BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
	VALUES	.30	.24	.21	.16	.16	.16	.14	.14	.13	.07	.04

-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	488.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	THRIE	C	A	G3	E	D	B	G4W	G1
	VALUES	30.34	48.23	48.37	50.34	51.37	54.68	55.83	57.28	68.11	68.31	133.28
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	411.75	433.82	464.85	518.87	634.30	636.54	650.75	666.70	685.78	766.84	1373.15
	BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
	VALUES	.30	.24	.22	.17	.17	.16	.15	.14	.14	.07	.07

D-4-0

D-4-2

SUMMARY OF RESULTS ALL DIVIDED HIGHWAYS W/ 4-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 6 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 360.39
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 10 8 6 4

STATE COST	1	2	3	4	5	6	7	8	9	10	11
VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
SOCIETAL COST	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
VALUES	THRIE	D	C	G3	G4S	E	A	G2	B	G4W	G1
TOTAL COST	78.98	103.40	104.73	108.97	162.94	167.29	168.88	178.78	186.49	186.72	376.68
VALUES	C	G2	A	G1	D	E	B	G4S	THRIE	G4W	G3
BENEFIT/COST	573.21	582.26	587.36	655.16	696.88	745.76	754.97	781.42	797.45	805.20	1427.44
VALUES	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
	.55	.46	.45	.43	.39	.33	.32	.31	.28	.19	-.06

STATE COST	1	2	3	4	5	6	7	8	9	10	11
VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
SOCIETAL COST	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
VALUES	THRIE	D	C	G3	G4S	E	A	G2	B	G4W	G1
TOTAL COST	75.59	97.81	97.97	102.23	154.92	159.93	160.72	168.53	177.69	177.91	376.69
VALUES	C	G2	A	G1	D	E	B	G4S	THRIE	G4W	G3
BENEFIT/COST	566.45	572.00	579.20	655.16	691.29	738.41	746.16	773.39	794.06	796.39	1420.71
VALUES	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
	.56	.48	.48	.44	.40	.35	.33	.32	.30	.20	-.06

STATE COST	1	2	3	4	5	6	7	8	9	10	11
VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
SOCIETAL COST	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
VALUES	THRIE	D	C	G3	G4S	E	A	G2	B	G4W	G1
TOTAL COST	71.96	90.75	91.82	95.00	146.10	151.71	151.84	157.38	168.02	168.25	376.69
VALUES	C	G2	A	G1	D	E	B	G4S	THRIE	G4W	G3
BENEFIT/COST	559.22	560.86	570.19	655.17	685.30	730.31	736.50	764.57	785.72	790.44	1413.47
VALUES	C	G2	A	D	THRIE	E	G4S	B	G4W	G3	G1
	.58	.50	.50	.45	.40	.36	.35	.34	.31	.20	-.06

STATE COST	1	2	3	4	5	6	7	8	9	10	11
VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
SOCIETAL COST	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
VALUES	THRIE	D	C	G3	G4S	E	A	G2	B	G4W	G1
TOTAL COST	68.15	83.20	85.55	87.42	136.54	141.93	143.03	145.44	157.61	157.82	376.70
VALUES	G2	C	A	G1	D	E	B	G4S	THRIE	G4W	G3
BENEFIT/COST	548.92	551.66	560.41	655.17	679.02	721.50	726.08	755.02	775.30	786.62	1405.90
VALUES	C	G2	A	D	THRIE	E	G4S	B	G4W	G3	G1
	.59	.53	.52	.46	.41	.38	.36	.36	.33	.21	-.06

STATE COST	1	2	3	4	5	6	7	8	9	10	11
VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
SOCIETAL COST	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
VALUES	THRIE	D	C	G3	G4S	E	A	G2	B	G4W	G1
TOTAL COST	64.24	75.61	79.20	79.79	126.42	131.56	132.95	133.63	146.65	146.86	376.70
VALUES	G2	C	A	G1	D	E	B	G4S	THRIE	G4W	G3
BENEFIT/COST	536.43	544.08	550.04	655.17	672.68	712.10	715.12	744.89	765.34	782.72	1398.27
VALUES	C	G2	A	D	THRIE	E	G4S	B	G4W	G3	G1
	.61	.56	.55	.47	.41	.34	.38	.38	.35	.21	-.06

A.242

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 4-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 6 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 360.39

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	C	G3	D	G4S	G2	A	E	B	G4W	G1
	VALUES	60.39	68.40	72.55	73.14	116.00	120.29	120.92	123.85	135.50	135.71	376.70
	TOTAL COST	G2	C	A	G1	D	E	B	G4S	G4W	THRIE	G3
	VALUES	523.77	536.87	539.39	655.17	666.61	702.32	703.98	734.47	754.19	778.87	1341.03
	BENEFIT/COST	C	G2	A	D	THRIE	E	B	G4S	G4W	G3	G1
	VALUES	.62	.60	.57	.48	.42	.41	.40	.40	.36	.22	-.06

-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	C	G3	D	G4S	G2	A	E	B	G4W	G1
	VALUES	56.80	62.08	66.23	67.76	105.63	107.93	110.37	113.97	124.62	124.82	376.68
	TOTAL COST	G2	A	C	G1	D	E	B	G4S	G4W	THRIE	G3
	VALUES	511.41	528.85	530.55	655.16	661.23	692.45	693.04	724.11	743.30	775.28	1384.70
	BENEFIT/COST	C	G2	A	D	E	THRIE	B	G4S	G4W	G3	G1
	VALUES	.64	.63	.60	.49	.43	.42	.41	.41	.38	.22	-.06

-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	C	G3	D	G4S	G2	A	E	B	G4W	G1
	VALUES	59.63	57.06	61.23	63.39	95.63	96.27	100.27	104.24	114.36	114.56	376.66
	TOTAL COST	G2	A	C	G1	D	E	B	G4S	G4W	THRIE	G3
	VALUES	499.74	518.74	525.54	655.13	656.87	682.71	682.84	714.11	733.04	772.10	1379.70
	BENEFIT/COST	G2	C	A	D	E	B	G4S	THRIE	G4W	G3	G1
	VALUES	.65	.65	.62	.50	.44	.43	.43	.43	.40	.23	-.06

-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	C	G3	D	G4S	G2	A	E	B	G4W	G1
	VALUES	50.87	53.34	57.56	60.04	85.36	86.04	90.64	94.70	104.28	104.97	376.61
	TOTAL COST	G2	A	C	G1	D	E	B	G4S	G4W	THRIE	G3
	VALUES	488.84	509.12	521.81	653.51	655.09	673.18	673.25	704.52	723.45	769.35	1376.03
	BENEFIT/COST	G2	C	A	D	E	B	G4S	THRIE	G4W	G3	G1
	VALUES	.68	.66	.64	.51	.46	.45	.44	.43	.41	.23	-.06

-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	C	G3	D	G4S	G2	A	E	B	G4W	G1
	VALUES	48.37	50.41	54.69	57.30	74.85	76.62	81.23	85.20	95.53	95.72	376.56
	TOTAL COST	G2	A	C	D	G1	E	B	G4S	G4W	THRIE	G3
	VALUES	478.33	499.71	518.88	650.77	655.03	663.68	669.00	695.10	714.20	766.84	1373.17
	BENEFIT/COST	G2	A	C	D	E	B	G4S	THRIE	G4W	G3	G1
	VALUES	.71	.67	.66	.51	.48	.47	.46	.43	.43	.23	-.06

A.243

D-4-2

D-4-4

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 4-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 8 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 310.72
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

OF CURVE

1	2	3	4	5	6	7	8	9	10	11		
10	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	A	C	B	G3	B	G4W	G1
	VALUES	62.20	70.89	73.28	75.40	78.67	79.90	82.76	86.63	97.77	98.00	279.74
	TOTAL COST	G2	A	C	G1	E	B	D	G4S	G4W	THRIE	G3
	VALUES	465.68	498.38	551.24	558.22	651.76	666.25	668.87	689.37	716.48	797.15	1405.11
	BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
	VALUES	.62	.55	.49	.41	.40	.39	.37	.34	.32	.17	.11
8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	A	C	B	G3	B	G4W	G1
	VALUES	57.77	68.83	71.79	73.95	75.91	76.85	79.27	83.21	94.66	94.88	271.31
	TOTAL COST	G2	A	C	G1	E	B	D	G4S	G4W	THRIE	G3
	VALUES	461.25	495.32	547.74	555.78	650.27	663.13	667.43	687.31	713.36	793.89	1401.68
	BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
	VALUES	.43	.56	.49	.41	.40	.39	.38	.35	.33	.17	.12
6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	A	C	B	G3	B	G4W	G1
	VALUES	53.05	66.58	70.25	71.87	72.37	73.52	75.50	79.49	91.30	91.52	274.73
	TOTAL COST	G2	A	C	G1	E	B	D	G4S	G4W	THRIE	G3
	VALUES	456.53	491.99	543.98	553.20	648.73	659.78	665.84	685.06	710.00	790.34	1397.97
	BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
	VALUES	.64	.57	.50	.42	.40	.39	.39	.35	.33	.18	.13
4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	A	C	B	G3	B	G4W	G1
	VALUES	48.17	64.16	68.10	68.62	69.86	70.63	71.52	75.54	87.74	87.96	271.99
	TOTAL COST	G2	A	C	G1	E	B	D	G4S	G4W	THRIE	G3
	VALUES	451.64	488.44	539.99	550.46	647.09	664.11	664.11	682.63	706.44	786.58	1394.02
	BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
	VALUES	.65	.58	.51	.42	.40	.40	.39	.36	.34	.18	.14
2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	THRIE	A	C	B	G3	B	G4W	G1
	VALUES	43.33	61.58	64.22	65.29	66.86	67.41	68.74	71.46	84.06	84.27	269.07
	TOTAL COST	G2	A	C	G1	E	B	D	G4S	G4W	THRIE	G3
	VALUES	446.81	484.76	535.89	547.54	645.34	662.53	662.22	680.05	702.75	782.69	1389.94
	BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
	VALUES	.66	.58	.52	.42	.41	.40	.40	.37	.34	.18	.15

A.244

A.244

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 4-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 8 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 310.72
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11
 PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	VALUES	403.48	418.48	468.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G4S	THRIE	A	C	E	D	G3	B	G4W	G1	
38.89	VALUES	58.90	60.39	62.66	63.36	64.96	66.70	67.43	80.38	80.59	265.96	
	TOTAL COST	G2	A	C	E	B	D	G4S	G4W	THRIE	G3	
442.36	VALUES	481.13	531.83	544.44	643.44	648.86	660.18	677.37	699.07	778.86	1385.90	
	BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
.67	VALUES	.59	.53	.42	.41	.41	.41	.37	.35	.18	.16	

-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	VALUES	403.48	418.48	468.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G4S	THRIE	A	C	E	D	G3	B	G4W	G1	
35.22	VALUES	56.19	56.80	59.27	59.54	62.90	63.65	64.51	76.88	77.08	262.65	
	TOTAL COST	G2	A	C	E	B	D	G4S	G4W	THRIE	G3	
438.70	VALUES	477.74	528.02	541.12	641.38	645.35	657.99	674.66	695.56	775.28	1382.12	
	BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
.68	VALUES	.60	.54	.43	.41	.41	.41	.38	.35	.19	.17	

A.245

-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	VALUES	403.48	418.48	468.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G4S	THRIE	A	C	E	D	G3	B	G4W	G1	
32.65	VALUES	53.50	53.63	56.13	54.28	60.29	60.68	62.20	73.68	73.89	259.14	
	TOTAL COST	G2	A	C	E	B	D	G4S	G4W	THRIE	G3	
436.13	VALUES	474.76	524.61	537.61	639.16	642.16	655.68	671.98	692.36	772.10	1378.76	
	BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
.69	VALUES	.61	.54	.43	.42	.42	.42	.38	.36	.19	.19	

-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	VALUES	403.48	418.48	468.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G4S	THRIE	A	C	E	D	G3	B	G4W	G1	
31.16	VALUES	50.86	50.87	53.14	53.71	57.36	58.31	59.28	70.81	71.01	255.45	
	TOTAL COST	G2	A	C	E	B	D	G4S	G4W	THRIE	G3	
434.64	VALUES	472.19	521.62	533.93	636.79	639.28	653.26	669.34	689.48	769.35	1375.83	
	BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
.69	VALUES	.61	.55	.44	.42	.42	.42	.39	.36	.20	.19	

-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	VALUES	403.48	418.48	468.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G4S	THRIE	A	C	E	D	G3	B	G4W	G1	
30.34	VALUES	48.23	48.37	50.39	51.37	54.68	55.83	57.28	68.11	68.31	251.66	
	TOTAL COST	G2	A	C	E	B	D	G4S	G4W	THRIE	G3	
433.82	VALUES	469.85	518.87	530.13	634.30	636.59	650.75	666.70	686.78	766.84	1373.15	
	BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
.69	VALUES	.62	.56	.44	.43	.43	.42	.39	.37	.21	.19	

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D-4-6

SUMMARY OF RESULTS ALL DIVIDED HIGHWAYS W/ 4-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 10 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 268.14
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

10	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	C	D	G4S	B	G4W	G1	146.35
VALUES	34.62	70.84	72.99	75.40	78.57	79.90	82.76	86.63	97.77	THRIE	1405.11
TOTAL COST	G2	G1	A	C	E	D	G4S	B	G4W	G1	1405.11
VALUES	438.10	474.82	498.38	551.24	651.47	666.25	668.87	689.37	716.48	THRIE	1405.11
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1	14
VALUES	.58	.45	.40	.34	.32	.32	.30	.28	.26	.26	.14

8	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	C	D	G4S	B	G4W	G1	146.35
VALUES	34.27	68.83	71.62	73.95	75.41	76.85	79.27	83.21	94.64	THRIE	1405.11
TOTAL COST	G2	G1	A	C	E	D	G4S	B	G4W	G1	1405.11
VALUES	437.74	470.05	495.32	547.74	650.10	665.13	667.43	687.31	713.36	THRIE	1405.11
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1	14
VALUES	.58	.46	.40	.34	.33	.32	.31	.28	.27	.27	.14

6	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	C	D	G4S	B	G4W	G1	146.35
VALUES	33.89	66.58	70.16	71.87	72.37	73.52	75.50	79.49	91.30	THRIE	1405.11
TOTAL COST	G2	G1	A	C	E	D	G4S	B	G4W	G1	1405.11
VALUES	437.36	464.70	491.99	543.98	648.63	659.78	665.84	685.06	710.00	THRIE	1405.11
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1	14
VALUES	.58	.47	.41	.34	.33	.33	.31	.29	.24	.27	.14

4	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	C	D	G4S	B	G4W	G1	146.35
VALUES	33.48	64.16	68.10	68.57	69.96	70.63	71.52	75.54	87.74	THRIE	1405.11
TOTAL COST	G2	G1	A	C	E	D	G4S	B	G4W	G1	1405.11
VALUES	436.95	458.74	488.44	539.99	647.05	656.22	664.11	682.63	706.44	THRIE	1405.11
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1	14
VALUES	.58	.47	.42	.34	.33	.33	.32	.29	.28	.28	.15

2	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	C	D	G4S	B	G4W	G1	146.35
VALUES	33.03	61.58	64.22	66.29	66.84	67.41	68.74	71.46	84.06	THRIE	1405.11
TOTAL COST	G2	G1	A	C	E	D	G4S	B	G4W	G1	1405.11
VALUES	436.50	452.16	484.76	535.89	645.32	652.53	662.22	680.05	702.75	THRIE	1405.11
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1	14
VALUES	.58	.48	.43	.35	.34	.34	.33	.32	.30	.28	.15

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 4-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 10 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 268.14
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
-0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	C	E	D	G3	B	G4W	G1
VALUES	32.55	58.90	60.39	62.66	63.36	64.95	66.70	67.43	80.38	80.59	166.51
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	436.02	444.99	481.13	531.83	643.43	648.86	660.18	677.37	699.07	728.86	1385.90
BENEFIT/COST	G2	A	C	GL	E	D	G4S	B	G4W	THRIE	G3
VALUES	.58	.49	.44	.36	.35	.34	.34	.33	.30	.29	.15
-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	C	E	D	G3	B	G4W	G1
VALUES	32.03	56.19	56.80	59.27	59.54	62.90	63.65	64.51	76.88	77.08	158.82
TOTAL COST	G2	G1	A	C	E	R	D	G4S	G4W	THRIE	G3
VALUES	435.51	437.30	477.74	528.02	641.38	645.35	657.99	674.66	695.56	725.28	1382.12
BENEFIT/COST	G2	A	C	GL	E	D	G4S	B	G4W	THRIE	G3
VALUES	.59	.50	.45	.39	.35	.34	.34	.34	.31	.29	.16
-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	C	A	G3	E	D	H	G4W	G1
VALUES	31.49	53.50	53.63	56.13	56.28	60.29	60.68	62.20	73.69	73.89	150.68
TOTAL COST	G1	G2	A	C	E	R	D	G4S	G4W	THRIE	G3
VALUES	429.15	434.96	474.76	524.61	639.16	642.16	655.68	671.98	692.36	722.10	1378.76
BENEFIT/COST	G2	A	C	GL	E	G4S	D	B	G4W	THRIE	G3
VALUES	.59	.51	.45	.42	.36	.35	.35	.34	.31	.30	.16
-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	C	A	G3	E	D	B	G4W	G1
VALUES	30.91	50.86	50.87	53.14	53.71	57.36	58.31	59.78	70.81	71.01	142.14
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	420.62	434.39	472.19	521.62	636.79	639.28	653.26	669.34	689.48	769.35	1375.63
BENEFIT/COST	G2	A	C	GL	E	G4S	D	B	G4W	THRIE	G3
VALUES	.59	.51	.46	.45	.36	.35	.35	.35	.32	.30	.16
-8 STATE COST	G1	G2	A	C	H	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	C	A	G3	E	D	B	G4W	G1
VALUES	30.32	48.23	48.37	50.39	51.37	54.68	55.83	57.28	68.11	68.31	132.27
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	411.75	433.80	469.85	518.87	639.30	636.59	650.75	666.70	686.78	766.84	1373.15
BENEFIT/COST	G2	A	GL	C	E	G4S	D	B	G4W	THRIE	G3
VALUES	.59	.52	.48	.46	.37	.36	.36	.35	.32	.31	.16

A.247

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SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 4-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 231.79
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4W 618.48	G4S 618.48	THRIE 718.48	G3 1318.48
SOCIETAL COST VALUES	G2 34.62	G1 65.90	G4S 70.89	E 72.99	D 75.90	THRIE 78.67	A 79.90	C 82.76	G3 86.63	B 97.77	G4W 98.00
TOTAL COST VALUES	G1 344.37	G2 438.10	A 498.38	C 551.24	E 651.46	D 666.25	B 688.87	G4S 689.37	G4W 716.48	THRIE 797.15	G3 1405.11
BENEFIT/COST VALUES	G1 .60	G2 .49	A .36	C .32	E .27	D .26	G4S .26	B .24	G4W .22	THRIE .21	G3 .11
8 STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4W 618.48	G4S 618.48	THRIE 718.48	G3 1318.48
SOCIETAL COST VALUES	G2 34.27	G1 61.58	G4S 68.83	E 71.62	D 73.95	THRIE 75.41	A 76.85	C 79.27	G3 83.21	B 94.66	G4W 94.88
TOTAL COST VALUES	G1 340.06	G2 437.74	A 495.32	C 547.74	E 650.10	D 663.13	B 667.43	G4S 682.31	G4W 713.36	THRIE 793.89	G3 1401.68
BENEFIT/COST VALUES	G1 .61	G2 .49	A .37	C .33	E .28	D .27	G4S .26	B .24	G4W .22	THRIE .22	G3 .11
6 STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4W 618.48	G4S 618.48	THRIE 718.48	G3 1318.48
SOCIETAL COST VALUES	G2 33.89	G1 57.00	G4S 66.58	E 70.16	D 71.87	THRIE 72.37	A 73.52	C 75.50	G3 79.49	B 91.30	G4W 91.52
TOTAL COST VALUES	G1 335.47	G2 437.36	A 491.99	C 543.98	E 648.63	D 659.78	B 665.84	G4S 685.06	G4W 710.00	THRIE 790.34	G3 1392.97
BENEFIT/COST VALUES	G1 .63	G2 .49	A .38	C .33	E .28	D .27	G4S .27	B .25	G4W .23	THRIE .22	G3 .12
4 STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4W 618.48	G4S 618.48	THRIE 718.48	G3 1318.48
SOCIETAL COST VALUES	G2 33.48	G1 52.26	G4S 64.16	E 68.10	D 68.57	THRIE 69.96	A 70.63	C 71.52	G3 75.54	B 87.74	G4W 87.96
TOTAL COST VALUES	G1 330.74	G2 436.95	A 488.44	C 539.99	E 647.05	D 656.22	B 664.11	G4S 682.63	G4W 706.44	THRIE 786.58	G3 1394.02
BENEFIT/COST VALUES	G1 .64	G2 .49	A .39	C .34	E .28	D .27	G4S .27	B .25	G4W .23	THRIE .23	G3 .12
2 STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4W 618.48	G4S 618.48	THRIE 718.48	G3 1318.48
SOCIETAL COST VALUES	G2 33.03	G1 47.61	G4S 61.58	E 64.22	D 66.29	THRIE 66.84	A 67.41	C 68.74	G3 71.46	B 84.06	G4W 84.27
TOTAL COST VALUES	G1 326.08	G2 436.50	A 484.76	C 535.89	E 645.32	D 652.53	B 662.22	G4S 680.05	G4W 702.75	THRIE 782.59	G3 1389.94
BENEFIT/COST VALUES	G1 .66	G2 .49	A .40	C .35	E .29	D .28	G4S .27	B .26	G4W .24	THRIE .23	G3 .12

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 4-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 231.79

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0 STATE COST	G1	G2	A	C	R	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	C	E	D	G3	B	G4W
VALUES	32.55	43.35	58.90	60.39	62.66	63.36	64.95	66.70	67.43	80.38	80.59
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	321.83	436.02	481.13	531.83	643.43	648.86	660.18	677.37	694.07	728.86	1385.90
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
VALUES	.68	.49	.40	.36	.29	.28	.28	.27	.24	.24	.12

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	C	E	G3	D	B	G4W
VALUES	32.03	39.40	56.19	56.80	59.27	59.54	62.90	63.65	64.51	76.88	77.08
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	318.37	435.51	477.74	528.02	641.38	645.35	657.99	674.66	695.56	775.29	1382.12
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
VALUES	.69	.50	.41	.37	.29	.28	.28	.27	.25	.24	.13

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	C	E	G3	D	B	G4W
VALUES	31.49	37.54	53.50	53.63	56.13	56.28	60.29	60.68	62.20	73.68	73.89
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	316.02	434.96	474.76	524.61	639.16	642.16	655.68	671.98	692.36	772.10	1373.76
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
VALUES	.70	.50	.42	.37	.30	.29	.29	.28	.26	.25	.13

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	C	E	G3	D	B	G4W
VALUES	30.91	36.28	50.86	50.87	53.14	53.71	57.35	58.31	59.78	70.81	71.01
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	314.76	434.39	472.19	521.62	636.79	639.28	653.26	669.34	689.48	769.35	1375.83
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
VALUES	.70	.50	.43	.38	.30	.29	.29	.28	.26	.25	.13

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	C	E	G3	D	B	G4W
VALUES	30.32	35.70	48.23	48.37	50.39	51.37	54.68	55.93	57.20	68.11	68.31
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	314.18	433.80	469.85	518.87	634.30	636.59	650.75	666.70	686.78	766.84	1373.15
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
VALUES	.70	.50	.43	.39	.30	.30	.29	.29	.26	.26	.13

A.249

D-4-8

D-4-10

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 4-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 200.87
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G+W	G+S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G+S	E	D	THRIE	A	C	G3	B	G+W
VALUES	34.62	38.25	70.89	72.99	75.40	78.67	79.90	82.76	86.63	97.77	98.00
TOTAL COST	G1	G2	A	C	E	B	D	G+S	G+W	THRIE	G3
VALUES	316.73	438.10	498.38	551.24	651.46	666.25	668.87	689.37	716.48	797.15	1405.11
BENEFIT/COST	G1	G2	A	C	E	D	G+S	B	THRIE	G+W	G3
VALUES	.58	.41	.29	.25	.22	.21	.21	.18	.17	.17	.09
8 STATE COST	G1	G2	A	C	B	E	D	G+W	G+S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G+S	E	D	THRIE	A	C	G3	B	G+W
VALUES	34.27	37.44	68.83	71.62	73.95	75.41	76.95	79.27	83.21	94.66	94.98
TOTAL COST	G1	G2	A	C	E	B	D	G+S	G+W	THRIE	G3
VALUES	316.41	437.74	495.32	547.74	650.10	663.13	667.43	687.31	713.36	793.89	1401.68
BENEFIT/COST	G1	G2	A	C	E	D	G+S	B	THRIE	G+W	G3
VALUES	.59	.41	.30	.26	.22	.21	.21	.19	.17	.17	.09
6 STATE COST	G1	G2	A	C	B	E	D	G+W	G+S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G+S	E	D	THRIE	A	C	G3	B	G+W
VALUES	33.89	37.67	66.58	70.16	71.87	72.37	73.52	75.50	79.49	91.30	91.52
TOTAL COST	G1	G2	A	C	E	B	D	G+S	G+W	THRIE	G3
VALUES	316.14	437.36	491.99	543.98	648.63	659.78	665.84	685.06	710.00	790.34	1347.97
BENEFIT/COST	G1	G2	A	C	E	G+S	D	B	THRIE	G+W	G3
VALUES	.59	.41	.30	.27	.23	.22	.22	.19	.18	.18	.09
4 STATE COST	G1	G2	A	C	B	E	D	G+W	G+S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G+S	THRIE	E	A	D	C	G3	B	G+W
VALUES	33.48	37.42	64.16	68.10	68.57	69.46	70.63	71.52	75.54	87.74	87.96
TOTAL COST	G1	G2	A	C	E	B	D	G+S	G+W	THRIE	G3
VALUES	315.90	436.95	488.44	539.99	647.05	656.22	664.11	682.63	706.44	786.58	1344.02
BENEFIT/COST	G1	G2	A	C	E	G+S	D	B	THRIE	G+W	G3
VALUES	.59	.41	.31	.28	.23	.22	.22	.20	.18	.18	.10
2 STATE COST	G1	G2	A	C	B	E	D	G+W	G+S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G+S	THRIE	A	E	C	D	G3	B	G+W
VALUES	33.03	37.18	61.58	64.22	66.29	66.84	67.41	68.74	71.46	84.06	84.27
TOTAL COST	G1	G2	A	C	E	B	D	G+S	G+W	THRIE	G3
VALUES	315.66	436.50	484.76	535.89	645.32	652.53	662.22	680.05	702.75	782.68	1384.94
BENEFIT/COST	G1	G2	A	C	E	G+S	D	B	THRIE	G+W	G3
VALUES	.59	.42	.32	.28	.23	.23	.22	.21	.19	.19	.10

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 4-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 200.87
 ADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1	2	3	4	5	6	7	8	9	10	11
0 STATE COST										
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST										
G1	G4S	THRIE	A	C	E	D	G3	D	B	G4W
32.55	36.94	58.90	60.39	62.66	63.36	64.95	66.70	67.43	80.38	80.59
TOTAL COST										
G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
315.41	436.02	481.13	531.83	643.43	648.86	660.18	677.37	699.07	778.86	1385.90
BENEFIT/COST										
G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
.59	.42	.33	.29	.23	.23	.23	.21	.20	.19	.10
-2 STATE COST										
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST										
G1	G4S	THRIE	A	C	E	D	G3	D	B	G4W
32.03	36.66	56.19	56.80	59.27	59.54	62.90	63.65	64.51	76.88	77.08
TOTAL COST										
G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
315.14	435.51	477.74	528.02	641.38	645.35	657.99	674.66	695.56	775.28	1382.12
BENEFIT/COST										
G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
.59	.42	.34	.30	.24	.23	.23	.22	.20	.20	.10
-4 STATE COST										
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST										
G1	G4S	THRIE	A	C	E	D	G3	D	B	G4W
31.49	36.36	53.50	53.63	56.13	56.28	60.29	60.68	62.20	73.59	73.89
TOTAL COST										
G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
314.84	434.96	474.76	524.61	639.16	642.16	655.68	671.48	692.36	772.10	1378.76
BENEFIT/COST										
G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
.59	.42	.35	.31	.24	.24	.23	.22	.21	.20	.11
-6 STATE COST										
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST										
G1	G4S	THRIE	A	C	E	D	G3	D	B	G4W
30.91	36.03	50.86	50.87	53.14	53.71	57.36	58.31	59.78	70.81	71.01
TOTAL COST										
G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
314.51	434.39	472.19	521.62	636.79	639.28	653.26	669.34	689.48	769.35	1375.63
BENEFIT/COST										
G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
.59	.42	.35	.32	.25	.24	.24	.23	.21	.21	.11
-8 STATE COST										
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST										
G1	G4S	THRIE	A	C	E	D	G3	D	B	G4W
30.32	35.68	48.23	48.37	50.39	51.37	54.68	55.83	57.28	68.11	68.31
TOTAL COST										
G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
314.16	433.80	469.85	518.87	634.30	636.59	650.75	666.70	686.78	766.84	1373.15
BENEFIT/COST										
G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
.59	.42	.36	.32	.25	.25	.24	.23	.21	.21	.11

A.251

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D-4-12

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 4-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 174.68
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1316.48
34.62	SOCIETAL COST	G1	G4S	E	D	THRIE	A	C	G3	B	G4W	96.00
316.36	TOTAL COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
316.36	VALUES	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
316.36	BENEFIT/COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
.49	VALUES	.49	.35	.23	.20	.18	.17	.17	.14	.13	.12	.07
8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1316.48
34.27	SOCIETAL COST	G1	G4S	E	D	THRIE	A	C	G3	B	G4W	94.88
316.20	TOTAL COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
316.20	VALUES	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
316.20	BENEFIT/COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
.49	VALUES	.49	.35	.23	.20	.18	.17	.17	.14	.13	.12	.07
6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1316.48
33.89	SOCIETAL COST	G1	G4S	E	D	THRIE	A	C	G3	B	G4W	91.52
316.03	TOTAL COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
316.03	VALUES	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
316.03	BENEFIT/COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
.49	VALUES	.49	.35	.24	.21	.18	.17	.17	.15	.14	.13	.07
4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1316.48
33.48	SOCIETAL COST	G1	G4S	E	D	THRIE	A	C	G3	B	G4W	87.96
315.84	TOTAL COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
315.84	VALUES	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
315.84	BENEFIT/COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
.49	VALUES	.49	.35	.25	.22	.18	.18	.18	.15	.14	.13	.08
2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1316.48
33.03	SOCIETAL COST	G1	G4S	E	D	THRIE	A	C	G3	B	G4W	84.27
315.63	TOTAL COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
315.63	VALUES	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
315.63	BENEFIT/COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
.49	VALUES	.49	.35	.26	.23	.19	.19	.18	.16	.15	.15	.08

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 4-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 174.68

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

0 STATE COST
 VALUES 278.48 403.48 418.48 468.48 548.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST
 VALUES 32.55 36.93 58.90 60.39 62.66 63.36 64.95 64.70 67.43 80.38 80.59
 TOTAL COST
 VALUES 315.90 435.02 481.13 531.83 613.93 648.86 660.18 677.37 699.07 778.86 1398.90
 BENEFIT/COST
 VALUES .49 .35 .27 .24 .19 .19 .19 .17 .17 .15 .08

-2 STATE COST
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST
 VALUES 32.03 36.66 56.19 56.80 59.27 59.54 62.90 63.65 64.51 76.88 77.08
 TOTAL COST
 VALUES 315.14 435.51 477.74 528.02 641.38 645.35 657.99 674.66 695.56 775.28 1395.12
 BENEFIT/COST
 VALUES .50 .35 .28 .25 .19 .19 .19 .17 .17 .16 .08

A.253

-4 STATE COST
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST
 VALUES 31.49 36.36 53.50 53.63 56.13 56.28 60.29 60.68 62.20 73.68 73.29
 TOTAL COST
 VALUES 314.84 434.96 474.76 524.61 639.16 642.15 655.68 671.98 692.36 772.10 1378.76
 BENEFIT/COST
 VALUES .50 .35 .28 .25 .20 .20 .20 .18 .17 .16 .09

-6 STATE COST
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST
 VALUES 30.91 36.03 50.86 50.87 53.14 53.71 57.36 58.31 59.78 70.81 71.01
 TOTAL COST
 VALUES 314.51 434.39 472.19 521.62 636.79 639.28 655.26 669.34 689.48 769.35 1375.83
 BENEFIT/COST
 VALUES .50 .36 .29 .26 .20 .20 .20 .18 .17 .17 .09

-8 STATE COST
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST
 VALUES 30.32 35.68 48.23 48.37 50.39 51.37 54.68 55.83 57.28 68.11 68.31
 TOTAL COST
 VALUES 314.16 433.80 469.85 518.87 634.30 636.59 650.75 666.70 686.78 766.84 1373.15
 BENEFIT/COST
 VALUES .50 .36 .29 .27 .21 .20 .20 .19 .18 .17 .09

D-4-12

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ EMBANKMENT HINGE AT 5 FT

D-5-0

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 5 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 141.27

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	G3	B	G4W	G1
VALUES	65.99	71.77	72.98	74.92	80.42	80.81	85.50	88.55	98.75	98.48	193.45
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	469.47	472.42	498.89	553.98	651.45	667.23	668.40	690.24	717.45	799.28	1407.03
BENEFIT/COST	G2	A	C	E	G4S	D	THRIE	B	G4W	G3	G1
VALUES	.19	.15	.12	.12	.11	.11	.08	.07	.07	.04	-.19

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	G3	B	G4W	G1
VALUES	61.83	70.06	71.70	73.75	77.86	78.05	82.38	85.65	95.98	96.20	190.16
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	465.30	468.63	496.34	550.86	650.18	666.46	667.23	688.54	714.67	796.53	1404.13
BENEFIT/COST	G2	A	C	E	G4S	D	THRIE	B	G4W	G3	G1
VALUES	.20	.15	.13	.12	.12	.11	.09	.08	.07	.04	-.18

A.254

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	G3	B	G4W	G1
VALUES	57.28	68.16	70.38	72.46	74.95	74.97	78.97	82.40	92.95	93.16	185.88
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	480.76	467.36	493.44	547.44	648.86	661.42	665.93	686.64	711.64	793.43	1400.87
BENEFIT/COST	G2	A	C	E	G4S	D	THRIE	B	G4W	G3	G1
VALUES	.21	.16	.13	.12	.12	.12	.09	.09	.08	.04	-.16

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	G3	B	G4W	G1
VALUES	52.38	66.04	68.94	71.01	71.50	71.74	75.24	78.78	89.64	89.85	181.05
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	455.85	459.52	490.21	543.71	647.47	658.11	664.49	684.52	708.33	789.98	1397.25
BENEFIT/COST	G2	A	C	E	G4S	D	THRIE	B	G4W	G3	G1
VALUES	.22	.17	.14	.12	.12	.12	.10	.09	.08	.05	-.14

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	G3	B	G4W	G1
VALUES	47.21	63.72	67.50	67.75	68.21	69.40	71.23	74.84	86.08	86.29	175.60
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	450.68	454.08	496.68	539.71	645.97	654.56	662.88	682.19	704.76	786.22	1393.32
BENEFIT/COST	G2	A	C	E	G4S	D	THRIE	B	G4W	G3	G1
VALUES	.23	.17	.15	.13	.13	.12	.10	.10	.09	.05	-.12

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ EMBANKMENT HINGE AT 5 FT

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 5 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 141.27
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
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11 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	E	C	D	G3	H	G4W	G1
VALUES	42.00	61.20	63.81	64.49	65.86	67.05	67.62	70.71	82.35	82.56	169.52
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	445.48	448.00	482.97	535.53	644.34	650.83	661.10	674.68	701.03	782.28	1389.19
BENEFIT/COST	G2	A	C	E	G4S	D	THRIE	B	G4W	G3	G1
VALUES	.25	.18	.16	.13	.13	.12	.11	.10	.09	.05	-.10

12 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	C	E	D	G3	H	G4W	G1
VALUES	37.13	58.57	54.88	60.80	62.90	64.07	65.67	66.59	78.61	78.81	162.81
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	440.65	441.28	479.28	531.37	642.54	647.08	659.15	677.04	697.29	778.36	1385.06
BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
VALUES	.26	.19	.17	.13	.13	.13	.11	.11	.10	.06	-.08

14 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	C	E	D	G3	H	G4W	G1
VALUES	33.27	55.84	56.24	57.39	59.02	62.08	62.75	63.55	75.07	75.27	155.51
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	433.94	435.75	475.86	527.50	640.55	643.55	657.03	674.36	693.74	774.71	1381.23
BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
VALUES	.27	.20	.18	.14	.14	.13	.12	.12	.11	.06	-.05

15 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	C	G3	E	D	B	G4W	G1
VALUES	39.71	53.04	53.23	54.47	55.64	59.42	59.88	61.26	71.90	72.09	147.68
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	426.15	434.19	472.94	524.12	638.35	640.38	654.74	671.71	690.57	771.57	1377.89
BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
VALUES	.27	.21	.18	.14	.14	.13	.12	.12	.11	.06	-.02

18 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	C	G3	E	D	B	G4W	G1
VALUES	29.40	50.39	50.58	51.99	52.70	56.55	57.47	58.81	69.06	69.25	139.26
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	417.74	432.87	470.47	521.18	635.94	637.54	652.29	669.06	687.73	768.86	1375.02
BENEFIT/COST	G2	A	C	G4S	E	D	B	THRIE	G4W	G3	G1
VALUES	.28	.21	.14	.15	.14	.14	.13	.13	.12	.06	.01

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 5-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 7 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 334.61

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	D	C	G3	G4S	E	A	B	G4W	G2	G1
VALUES	81.93	108.42	111.75	115.22	164.30	172.31	173.39	192.33	192.55	193.23	349.95
TOTAL COST	C	A	G2	G1	D	E	B	G4S	THRIE	G4W	G3
VALUES	580.22	591.86	596.70	628.42	701.89	750.79	760.81	787.78	800.41	811.03	1433.69
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1
VALUES	.48	.39	.38	.35	.35	.28	.27	.25	.23	.17	-.06
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	D	C	G3	G4S	E	A	B	G4W	G2	G1
VALUES	78.79	103.33	105.52	109.17	162.71	166.31	166.85	184.59	185.04	185.26	349.97
TOTAL COST	C	A	G2	G1	D	E	B	G4S	THRIE	G4W	G3
VALUES	574.00	595.32	588.07	628.44	696.81	744.74	753.52	781.18	797.27	803.74	1427.65
BENEFIT/COST	C	A	D	G2	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.49	.40	.39	.37	.36	.29	.28	.26	.24	.17	-.06
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	D	C	G3	G4S	A	E	B	G4W	G2	G1
VALUES	75.40	97.75	98.73	102.49	155.27	159.38	159.55	174.94	176.82	177.63	344.99
TOTAL COST	C	A	G2	G1	D	E	B	G4S	THRIE	G4W	G3
VALUES	567.20	577.86	578.41	628.47	691.22	738.03	745.29	773.75	793.88	795.51	1420.96
BENEFIT/COST	C	A	D	G2	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.50	.42	.40	.40	.36	.30	.29	.28	.25	.18	-.05
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	D	C	G3	G4S	A	E	B	G4W	G2	G1
VALUES	71.76	91.36	91.67	95.17	146.95	150.95	151.98	164.23	167.62	167.83	350.02
TOTAL COST	C	A	G2	G1	D	E	B	G4S	THRIE	G4W	G3
VALUES	559.84	567.71	569.43	628.49	685.14	730.45	736.09	765.42	786.31	790.24	1413.65
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.52	.44	.42	.41	.37	.32	.30	.29	.27	.18	-.06
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	D	C	G3	G4S	A	E	B	G4W	G2	G1
VALUES	67.88	83.54	85.19	87.35	137.77	141.60	143.60	152.54	157.51	157.71	350.05
TOTAL COST	C	A	G2	G1	D	E	B	G4S	THRIE	G4W	G3
VALUES	552.01	556.02	560.08	628.52	678.66	722.07	725.98	756.24	776.19	786.36	1405.83
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.54	.46	.45	.42	.37	.33	.32	.31	.29	.19	-.06

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 5-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSACLE DISTANCE = 2 FT
 PAVEMENT-TO-OBSACLE DISTANCE = 7 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 334.61

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

0 STATE COST
 VALUES
 SOCIETAL COST
 VALUES
 TOTAL COST
 VALUES
 BENEFIT/COST
 VALUES

-2 STATE COST
 VALUES
 SOCIETAL COST
 VALUES
 TOTAL COST
 VALUES
 BENEFIT/COST
 VALUES

-4 STATE COST
 VALUES
 SOCIETAL COST
 VALUES
 TOTAL COST
 VALUES
 BENEFIT/COST
 VALUES

-6 STATE COST
 VALUES
 SOCIETAL COST
 VALUES
 TOTAL COST
 VALUES
 BENEFIT/COST
 VALUES

-8 STATE COST
 VALUES
 SOCIETAL COST
 VALUES
 TOTAL COST
 VALUES
 BENEFIT/COST
 VALUES

D-5-4

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 5-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 9 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 285.60
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1	2	3	4	5	6	7	8	9	10	11
10	STATE COST	G1	G2	A	C	B	E	D	G4S	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	1318.48
	SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	G3	G1
	VALUES	65.99	71.77	74.04	74.92	80.42	80.81	85.50	95.75	272.44
	TOTAL COST	G2	A	G1	C	E	B	D	G4S	G3
	VALUES	469.47	498.89	550.92	553.98	652.52	667.23	668.40	717.45	1407.03
	BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1
	VALUES	.55	.50	.43	.37	.36	.35	.31	.29	.06

8	STATE COST	G1	G2	A	C	B	E	D	G4S	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	1318.48
	SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	G3	G1
	VALUES	61.83	70.06	72.40	73.75	77.86	78.05	82.38	95.98	270.27
	TOTAL COST	G2	A	G1	C	E	B	D	G4S	G3
	VALUES	455.30	496.34	548.75	550.86	650.88	665.46	667.23	714.67	1489.15
	BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1
	VALUES	.56	.50	.44	.37	.36	.35	.31	.29	.07

A.258

6	STATE COST	G1	G2	A	C	B	E	D	G4S	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	1318.48
	SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	G3	G1
	VALUES	52.28	68.16	70.82	72.46	74.95	74.97	78.97	92.95	262.46
	TOTAL COST	G2	A	G1	C	E	B	D	G4S	G3
	VALUES	460.76	493.44	546.43	547.44	649.29	661.42	665.93	711.64	1400.87
	BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1
	VALUES	.57	.51	.45	.38	.36	.35	.31	.29	.07

4	STATE COST	G1	G2	A	C	B	E	D	G4S	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	1318.48
	SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	G3	G1
	VALUES	52.38	66.04	69.24	71.01	71.50	71.74	75.24	89.64	265.48
	TOTAL COST	G2	A	C	G1	E	B	D	G4S	G3
	VALUES	455.85	490.21	543.71	543.95	647.72	658.11	664.49	708.33	1347.25
	BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1
	VALUES	.59	.52	.46	.38	.37	.36	.31	.29	.08

2	STATE COST	G1	G2	A	C	B	E	D	G4S	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	1318.48
	SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	G3	G1
	VALUES	47.21	63.72	67.63	67.75	68.21	69.40	71.23	86.08	242.81
	TOTAL COST	G2	A	C	G1	E	B	D	G4S	G3
	VALUES	450.68	486.68	539.71	541.29	646.10	659.56	662.88	704.76	1343.32
	BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1
	VALUES	.60	.53	.46	.38	.37	.36	.31	.29	.09

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 5-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 9 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 288.60

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

0 STATE COST
 VALUES G1 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST G2 G4S THRIE A E C D G3 B G4W G3
 VALUES 42.00 61.20 63.81 64.49 65.92 67.05 67.62 70.71 82.35 82.56 259.93
 TOTAL COST G2 A C G1 E D G4S G4W THRIE G3
 VALUES 445.48 482.97 535.53 538.41 644.40 650.83 661.10 674.68 701.03 782.28 1389.14
 BENEFIT/COST G2 A C E D G4S B G4W THRIE G3
 VALUES .61 .54 .47 .38 .37 .37 .36 .33 .31 .17 .10

-2 STATE COST
 VALUES G1 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST G2 G4S THRIE A E C D G3 B G4W G3
 VALUES 37.18 58.57 59.88 60.80 62.90 64.09 65.67 66.59 78.61 78.81 256.82
 TOTAL COST G2 A C G1 E D G4S G4W THRIE G3
 VALUES 440.65 479.28 531.37 535.29 642.57 647.08 659.15 672.04 697.29 778.36 1385.06
 BENEFIT/COST G2 A C E D G4S B G4W THRIE G3
 VALUES .62 .54 .48 .39 .38 .37 .37 .34 .32 .17 .11

A.259

-4 STATE COST
 VALUES G1 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST G2 G4S THRIE A E C D G3 B G4W G3
 VALUES 33.27 55.89 56.24 57.39 59.02 62.08 62.75 63.55 75.07 75.27 253.43
 TOTAL COST G2 A C G1 E D G4S G4W THRIE G3
 VALUES 436.75 475.86 527.50 531.91 640.56 643.55 657.03 674.36 693.74 774.71 1381.25
 BENEFIT/COST G2 A C E D G4S B G4W THRIE G3
 VALUES .63 .55 .49 .39 .38 .38 .38 .34 .32 .17 .13

-6 STATE COST
 VALUES G1 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST G2 G4S THRIE A E C D G3 B G4W G3
 VALUES 30.71 53.09 53.23 54.47 55.64 59.42 59.88 61.26 71.90 72.09 249.76
 TOTAL COST G2 A C G1 E D G4S G4W THRIE G3
 VALUES 434.19 472.94 524.12 528.24 638.36 640.38 654.24 671.71 690.57 771.57 1377.89
 BENEFIT/COST G2 A C E D G4S B G4W THRIE G3
 VALUES .64 .56 .50 .40 .38 .38 .38 .35 .33 .17 .14

-8 STATE COST
 VALUES G1 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST G2 G4S THRIE A E C D G3 B G4W G3
 VALUES 29.40 50.39 50.58 51.99 52.70 56.55 57.47 58.81 69.06 69.25 245.82
 TOTAL COST G2 A C G1 E D G4S G4W THRIE G3
 VALUES 432.87 470.47 521.18 524.29 635.94 637.54 652.29 669.06 687.23 768.86 1375.02
 BENEFIT/COST G2 A C E D G4S B G4W THRIE G3
 VALUES .64 .57 .50 .40 .39 .39 .38 .35 .33 .18 .15

D-5-4

D-5-6

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 5-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 11 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 249.24
 ADOT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	B	G4W	G1
VALUES	33.21	71.77	72.98	74.92	80.42	80.81	85.50	88.55	98.75	193.20
TOTAL COST	G2	G1	A	C	E	A	D	G4S	THRIE	G3
VALUES	436.68	471.68	498.90	553.98	651.45	667.23	668.40	690.24	799.28	1407.03
BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1	G3
VALUES	.54	.40	.35	.30	.29	.29	.26	.24	.20	.12

8 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	B	G4W	G1
VALUES	32.86	70.06	71.70	73.75	77.86	78.05	82.38	85.65	96.20	189.61
TOTAL COST	G2	G1	A	C	E	B	D	G4S	THRIE	G3
VALUES	436.34	468.08	496.34	550.86	650.18	664.45	667.23	688.54	794.47	1404.13
BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1	G3
VALUES	.54	.41	.36	.31	.30	.29	.27	.25	.21	.12

6 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	B	G4W	G1
VALUES	32.51	68.16	70.38	72.46	74.95	74.97	78.97	82.40	92.95	185.48
TOTAL COST	G2	G1	A	C	E	A	D	G4S	THRIE	G3
VALUES	435.99	463.96	493.45	547.44	648.86	661.42	665.93	686.64	793.43	1400.87
BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1	G3
VALUES	.54	.42	.36	.31	.30	.29	.27	.25	.23	.13

4 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	B	G4W	G1
VALUES	32.14	66.04	68.99	71.01	71.50	71.74	75.24	78.78	89.64	180.76
TOTAL COST	G2	G1	A	C	E	B	D	G4S	THRIE	G3
VALUES	435.62	459.24	490.21	543.71	647.47	658.11	664.49	684.52	789.98	1397.25
BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1	G3
VALUES	.54	.42	.37	.31	.30	.30	.28	.26	.25	.13

2 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	B	G4W	G1
VALUES	31.75	63.72	67.50	67.75	68.21	69.40	71.23	74.84	86.08	175.41
TOTAL COST	G2	G1	A	C	E	B	D	G4S	THRIE	G3
VALUES	435.23	453.88	486.68	539.71	645.97	654.56	662.88	682.19	789.76	1393.32
BENEFIT/COST	G2	A	C	E	D	G4S	B	G1	THRIE	G3
VALUES	.54	.43	.38	.31	.30	.30	.29	.27	.25	.13

A.260

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 5-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 11 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 249.24
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	E	C	D	G3	B	G4W	G1
VALUES	31.33	61.20	63.81	64.49	65.86	67.05	67.62	70.71	82.35	82.56	169.38
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	434.81	447.86	482.97	535.53	644.34	650.83	661.10	679.68	701.03	782.28	1389.19
BENEFIT/COST	G2	A	C	E	D	G4S	B	G1	G4W	THRIE	G3
VALUES	.54	.44	.39	.32	.31	.30	.29	.29	.27	.26	.14
-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	E	C	D	G3	B	G4W	G1
VALUES	30.87	58.57	59.88	60.80	62.90	64.07	65.67	66.59	78.61	78.81	162.71
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	434.35	441.19	479.28	531.37	642.54	647.08	659.15	677.04	697.29	778.36	1385.06
BENEFIT/COST	G2	A	C	E	G1	D	G4S	B	G4W	THRIE	G3
VALUES	.54	.45	.40	.32	.31	.31	.31	.30	.28	.26	.14
-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	THRIE	A	E	C	D	G3	B	G4W	G1
VALUES	30.38	55.89	56.24	57.39	59.02	62.08	62.75	63.55	75.07	75.27	155.44
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	433.86	433.92	475.86	527.50	640.55	643.55	657.03	674.36	693.74	774.71	1381.23
BENEFIT/COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	.54	.46	.41	.34	.32	.31	.31	.31	.28	.27	.14
-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	E	C	D	G3	B	G4W	G1
VALUES	29.85	53.09	53.23	54.47	55.64	59.42	59.88	61.26	71.90	72.09	147.63
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	426.10	433.33	472.94	524.12	638.35	640.38	654.74	671.71	690.57	771.57	1377.89
BENEFIT/COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	.54	.47	.41	.36	.33	.32	.32	.31	.29	.27	.14
-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	G4S	A	E	C	D	G3	B	G4W	G1
VALUES	29.28	50.39	50.58	51.99	52.70	56.55	57.47	58.81	69.06	69.25	139.23
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	417.71	432.76	470.47	521.18	635.94	637.54	652.29	669.06	687.73	768.86	1375.02
BENEFIT/COST	G2	A	C	G1	E	D	G4S	B	G4W	THRIE	G3
VALUES	.55	.47	.42	.40	.33	.32	.32	.32	.29	.28	.15

A.261

D-5-6

D-5-8

SUMMARY OF RESULTS ALL DIVIDED HIGHWAYS W/ 5-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 13 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 215.70
 ADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 10 8 6 4 2

1	2	3	4	5	6	7	8	9	10	11
STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G2	G4S	E	D	THRIE	C	G3	B	G4W
VALUES	33.21	69.50	71.76	72.97	74.92	80.42	80.81	85.50	98.75	98.97
TOTAL COST	G1	G2	A	C	B	D	G4W	G4S	THRIE	G3
VALUES	347.97	436.68	498.90	553.98	651.45	667.23	668.40	690.24	799.28	1407.03
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	.52	.45	.32	.28	.25	.24	.23	.21	.19	.10

STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	E	D	THRIE	C	G3	B	G4W
VALUES	32.86	65.41	70.06	71.70	73.75	77.86	78.05	82.38	95.48	95.20
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	343.88	436.34	496.34	550.86	650.18	664.45	667.23	688.54	794.67	1404.13
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	.54	.45	.33	.28	.25	.24	.24	.21	.19	.10

STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	E	D	THRIE	A	C	B	G4W
VALUES	32.51	60.96	68.16	70.38	72.46	74.95	74.97	78.97	92.40	92.16
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	339.43	435.99	493.45	547.44	646.86	661.42	665.93	686.64	793.64	1400.37
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	.56	.45	.34	.29	.25	.24	.24	.22	.20	.10

STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	E	D	THRIE	A	C	B	G4W
VALUES	32.14	56.16	66.04	68.99	71.01	71.50	71.74	75.24	84.64	84.85
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	339.64	435.62	490.21	549.71	647.47	658.11	664.49	684.52	789.98	1397.25
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	.57	.45	.34	.30	.25	.24	.24	.22	.20	.10

STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	E	D	THRIE	A	C	B	G4W
VALUES	31.75	51.12	63.72	67.50	67.75	68.21	69.40	71.23	74.84	86.08
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	329.59	435.23	486.68	539.71	645.97	654.56	662.88	682.19	786.22	1393.32
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
VALUES	.59	.46	.35	.31	.26	.25	.25	.23	.21	.11

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 5-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 13 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 215.70
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	E	C	D	G3	B	G4W
VALUES	31.33	46.07	61.20	63.81	64.49	65.86	67.05	67.62	70.71	82.35	22.56
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	324.54	434.81	482.97	535.53	644.34	650.83	661.10	679.68	701.03	782.28	1389.19
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
VALUES	.61	.46	.36	.32	.26	.25	.25	.23	.22	.21	.11
-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	C	E	D	G3	B	G4W
VALUES	30.87	41.41	58.57	59.88	60.80	62.90	64.07	65.67	66.59	78.61	78.81
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	319.89	434.35	479.28	531.37	642.54	647.08	659.15	677.04	697.29	778.36	1385.06
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
VALUES	.63	.46	.37	.33	.26	.25	.25	.24	.22	.22	.11
-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	C	E	D	G3	B	G4W
VALUES	30.38	37.69	55.89	56.24	57.39	59.02	62.08	62.75	63.55	75.07	75.27
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	316.17	433.86	475.86	527.50	640.55	643.55	657.03	674.36	693.74	774.71	1381.23
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
VALUES	.64	.46	.38	.33	.27	.26	.26	.25	.23	.22	.12
-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	THRIE	G4S	A	C	G3	E	D	B	G4W
VALUES	29.85	35.33	53.09	53.23	54.47	55.64	59.42	59.88	61.26	71.90	72.09
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	313.80	433.33	472.94	524.12	638.35	640.38	654.74	671.71	690.57	771.57	1377.89
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
VALUES	.65	.46	.39	.34	.27	.26	.26	.25	.23	.23	.12
-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	THRIE	G4S	A	C	G3	E	D	B	G4W
VALUES	29.28	34.22	50.39	50.58	51.99	52.70	56.55	57.47	58.81	69.06	69.25
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	312.70	432.76	470.47	521.18	635.94	637.54	652.29	669.06	687.73	768.86	1375.02
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
VALUES	.65	.46	.39	.35	.27	.27	.26	.26	.24	.23	.12

A.263

D-5-8

D-5-10

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 5-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 15 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 187.23
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	E	D	A	THRIE	C	G3	B	G4W
VALUES	33.20	37.39	71.76	72.97	74.92	80.42	80.81	85.50	88.55	98.75	98.97
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	315.87	435.68	498.90	553.98	651.45	667.23	668.40	690.24	717.45	799.28	1407.03
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.54	.38	.26	.22	.20	.19	.19	.16	.15	.14	.07
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	E	D	A	THRIE	C	G3	B	G4W
VALUES	32.86	36.79	70.06	71.70	73.75	77.86	78.05	82.38	85.65	95.98	96.20
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	315.25	436.34	496.34	550.86	650.18	664.45	667.23	688.54	714.67	796.53	1404.13
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.54	.38	.26	.22	.20	.19	.19	.16	.15	.15	.08
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	E	D	A	THRIE	C	G3	B	G4W
VALUES	32.51	36.30	68.16	70.38	72.46	74.95	74.97	78.97	82.40	92.95	93.15
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	314.78	435.99	493.45	547.44	648.86	661.42	665.93	686.64	711.54	793.43	1400.87
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.54	.38	.27	.23	.20	.19	.19	.17	.16	.15	.08
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	E	D	A	THRIE	C	G3	B	G4W
VALUES	32.14	35.91	66.04	68.99	71.01	71.50	71.74	75.24	78.78	89.64	89.85
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	314.39	435.62	490.21	543.71	647.47	658.11	664.49	684.52	708.33	789.98	1397.25
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.54	.38	.28	.24	.20	.20	.20	.17	.16	.16	.08
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	E	D	A	THRIE	C	G3	B	G4W
VALUES	31.75	35.59	63.72	67.50	67.75	68.21	69.40	71.23	74.84	86.08	86.29
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	314.07	435.23	486.68	539.71	645.97	654.56	662.88	682.19	704.76	786.22	1393.32
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.54	.39	.28	.25	.21	.20	.20	.18	.17	.16	.09

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 5-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 15 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 187.23

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	E	C	D	B	G4W
VALUES	31.33	35.31	61.20	63.81	64.49	65.86	67.05	67.62	70.71	82.56
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	313.79	434.81	482.97	535.53	644.34	650.83	661.10	679.68	782.28	1369.19
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G3
VALUES	.55	.39	.29	.26	.21	.20	.20	.18	.17	.09

-2 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	C	E	D	B	G4W
VALUES	30.87	35.05	58.57	59.88	60.80	62.40	64.07	66.59	78.61	78.81
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	313.52	434.35	479.28	531.37	642.54	647.08	659.15	677.04	778.56	1385.06
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G3
VALUES	.55	.39	.30	.27	.21	.20	.20	.19	.18	.09

A.265

-4 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	C	E	D	B	G4W
VALUES	30.38	34.77	55.89	56.24	57.39	59.02	62.08	62.75	75.07	75.27
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	313.24	433.86	475.86	527.50	640.55	643.55	657.03	674.36	774.71	1361.23
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G3
VALUES	.55	.39	.31	.27	.22	.21	.20	.18	.18	.09

-6 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	THRIE	G4S	A	C	G3	E	D	G4W
VALUES	29.85	34.46	53.09	53.23	54.47	55.64	59.42	59.88	71.40	72.09
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	312.93	433.33	472.94	524.12	638.35	640.38	654.74	671.71	771.57	1377.89
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G3
VALUES	.55	.39	.32	.28	.22	.22	.21	.20	.19	.10

-8 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	THRIE	G4S	A	C	G3	E	D	G4W
VALUES	29.28	34.11	50.39	50.58	51.99	52.70	56.55	57.47	69.06	69.25
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	312.58	432.76	470.47	521.18	635.94	637.54	652.29	669.06	768.66	1375.02
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G3
VALUES	.55	.39	.32	.29	.22	.22	.22	.21	.19	.10

D-5-10

D-5-12

SUMMARY OF RESULTS ALL DIVIDED HIGHWAYS W/ 5-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 17 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 163.15
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4W 618.48	G4S 618.48	THRIE 718.48	G3 1318.48
SOCIETAL COST VALUES	G1 33.20	G2 36.04	A 71.76	E 72.97	D 74.92	A 80.42	THRIE 80.81	C 85.50	G3 88.54	B 98.75	G4W 98.97
TOTAL COST VALUES	G1 314.52	G2 439.68	A 490.24	C 541.45	E 643.40	D 658.84	THRIE 689.23	G4S 690.24	G4W 717.45	THRIE 799.28	G3 1407.02
BENEFIT/COST VALUES	G1 .46	G2 .32	A .20	C .17	E .16	D .15	G4S .15	THRIE .11	G4W .11	B .10	G3 .06
8 STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4W 618.48	G4S 618.48	THRIE 718.48	G3 1318.48
SOCIETAL COST VALUES	G1 32.86	G2 35.90	A 70.06	E 71.70	D 73.75	A 77.86	THRIE 78.05	C 82.38	G3 85.65	B 95.93	G4W 96.20
TOTAL COST VALUES	G1 314.38	G2 436.34	A 490.34	C 550.86	E 650.18	D 664.45	THRIE 667.23	G4S 688.54	G4W 714.67	THRIE 796.53	G3 1404.13
BENEFIT/COST VALUES	G1 .46	G2 .32	A .20	C .17	E .16	D .15	G4S .15	THRIE .12	G4W .12	B .11	G3 .06
6 STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4W 618.48	G4S 618.48	THRIE 718.48	G3 1318.48
SOCIETAL COST VALUES	G1 32.51	G2 35.76	A 68.16	E 70.38	D 72.46	A 74.95	THRIE 74.97	C 78.97	G3 82.40	B 92.95	G4W 93.16
TOTAL COST VALUES	G1 314.23	G2 435.99	A 493.45	C 547.44	E 648.86	D 661.42	THRIE 665.93	G4S 686.84	G4W 711.64	THRIE 793.43	G3 1400.87
BENEFIT/COST VALUES	G1 .46	G2 .32	A .21	C .18	E .16	D .15	G4S .15	THRIE .12	G4W .12	B .11	G3 .06
4 STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4W 618.48	G4S 618.48	THRIE 718.48	G3 1318.48
SOCIETAL COST VALUES	G1 32.14	G2 35.60	A 66.04	E 68.99	D 71.01	A 71.50	THRIE 71.74	C 75.24	G3 78.78	B 89.64	G4W 89.85
TOTAL COST VALUES	G1 314.08	G2 435.62	A 490.21	C 543.71	E 647.47	D 658.11	THRIE 664.49	G4S 684.52	G4W 708.33	THRIE 789.98	G3 1397.25
BENEFIT/COST VALUES	G1 .46	G2 .32	A .22	C .19	E .16	D .16	G4S .16	THRIE .13	G4W .13	B .12	G3 .06
2 STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4W 618.48	G4S 618.48	THRIE 718.48	G3 1318.48
SOCIETAL COST VALUES	G1 31.75	G2 35.43	A 63.72	E 67.50	D 67.75	A 68.21	THRIE 69.40	C 71.23	G3 74.84	B 86.08	G4W 86.29
TOTAL COST VALUES	G1 313.91	G2 435.23	A 486.68	C 539.71	E 645.97	D 654.56	THRIE 662.88	G4S 682.19	G4W 704.76	THRIE 786.22	G3 1393.32
BENEFIT/COST VALUES	G1 .46	G2 .33	A .23	C .20	E .17	D .16	G4S .16	THRIE .14	G4W .14	B .13	G3 .07

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 5-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 17 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 163.15
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	E	C	D	G3	B	G4W
VALUES	31.33	35.24	61.20	63.81	64.49	65.86	67.05	67.62	70.71	82.35	82.56
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	313.71	434.81	482.97	535.53	644.34	650.83	661.10	679.68	701.03	782.28	1329.19
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
VALUES	.46	.33	.24	.21	.17	.16	.16	.14	.14	.13	.07
-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	C	E	D	G3	B	G4W
VALUES	30.87	35.02	58.57	59.88	60.80	62.90	64.07	65.67	66.59	78.61	78.81
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	313.49	434.35	479.28	531.37	642.54	647.08	659.15	672.04	697.29	778.36	1385.06
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
VALUES	.46	.33	.24	.21	.17	.17	.16	.15	.14	.14	.07
-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	THRIE	A	C	E	D	G3	B	G4W
VALUES	30.38	34.76	55.89	56.24	57.39	59.02	62.08	62.75	63.55	75.07	75.27
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	313.23	433.86	475.86	527.50	640.55	643.55	652.03	674.36	693.74	774.71	1381.23
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
VALUES	.46	.33	.25	.22	.17	.17	.17	.15	.15	.14	.08
-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	THRIE	G4S	A	C	G3	E	D	B	G4W
VALUES	29.85	34.45	53.09	53.23	54.47	55.64	59.42	59.88	61.26	71.90	72.09
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	312.93	433.33	472.94	524.12	638.35	640.38	654.74	671.71	690.57	771.57	1372.89
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
VALUES	.46	.33	.26	.23	.18	.18	.17	.16	.15	.15	.08
-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	THRIE	G4S	A	C	G3	E	D	B	G4W
VALUES	29.28	34.11	50.39	50.58	51.99	52.70	56.55	57.47	58.81	69.06	69.25
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	312.58	432.76	470.47	521.18	635.94	637.54	652.29	669.06	687.73	768.86	1375.02
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
VALUES	.46	.33	.27	.24	.18	.18	.18	.17	.16	.15	.08

A.267

D-5-12

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ EMBANKMENT HINGE AT 6 FT

D-6-0

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 6 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 131.16

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	G3	B	G4W	G1
	VALUES	68.61	71.12	72.35	73.28	79.26	80.78	86.49	88.28	98.24	98.45	188.65
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	467.13	472.09	497.74	554.96	650.83	666.71	666.76	684.60	716.92	799.26	1406.75
	BENEFIT/COST	G2	A	E	D	G4S	C	THRIE	B	G4W	G3	G1
	VALUES	.16	.12	.10	.10	.10	.10	.07	.06	.05	.03	-.21

5	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	G3	B	G4W	G1
	VALUES	64.62	64.73	71.03	72.34	77.17	78.56	83.66	85.91	95.72	95.93	185.54
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	464.01	468.09	495.65	552.14	649.51	664.20	665.81	688.21	714.41	797.04	1404.38
	BENEFIT/COST	G2	A	E	C	G4S	D	THRIE	B	G4W	G3	G1
	VALUES	.16	.13	.10	.10	.10	.10	.07	.06	.06	.03	-.20

5	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	G3	B	G4W	G1
	VALUES	60.28	64.17	69.74	71.30	74.76	75.94	80.58	83.14	92.94	93.20	182.05
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	460.52	463.76	493.23	549.06	648.21	661.46	664.78	686.65	711.67	794.46	1401.67
	BENEFIT/COST	G2	A	C	E	G4S	D	THRIE	B	G4W	G3	G1
	VALUES	.18	.13	.11	.11	.10	.10	.08	.07	.06	.04	-.18

4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	F	D	A	THRIE	C	G3	B	G4W	G1
	VALUES	55.55	55.41	68.43	70.14	71.97	73.02	77.14	80.08	89.94	90.19	178.10
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	456.58	459.03	490.45	545.67	646.91	658.47	663.61	684.88	708.67	791.50	1398.55
	BENEFIT/COST	G2	A	C	E	G4S	D	THRIE	B	G4W	G3	G1
	VALUES	.19	.14	.12	.11	.10	.10	.08	.07	.07	.04	-.17

2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	E	A	D	THRIE	C	G3	B	G4W	G1
	VALUES	50.41	64.41	67.08	68.80	68.82	69.66	73.47	76.55	86.70	86.90	173.62
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	452.10	453.88	487.28	541.95	645.56	655.18	662.30	682.89	705.38	788.14	1395.02
	BENEFIT/COST	G2	A	C	E	G4S	D	THRIE	B	G4W	G3	G1
	VALUES	.20	.15	.12	.11	.11	.11	.09	.08	.07	.04	-.15

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ EMBANKMENT HINGE AT 6 FT

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 6 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 131.16

AAOT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	E	THRIE	D	C	G3	B	G4W	G1
VALUES	44.95	62.19	65.29	65.66	65.94	67.34	69.45	72.65	83.14	83.34	168.64
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	447.02	448.42	483.75	533.92	644.13	651.61	660.82	680.65	701.81	784.42	1391.12
BENEFIT/COST	G2	A	C	E	G4S	D	THRIE	B	G4W	G3	G1
VALUES	.21	.16	.13	.11	.11	.11	.09	.08	.08	.04	-.13
-2											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	THRIE	E	C	D	G3	B	G4W	G1
VALUES	39.45	59.76	61.56	62.00	64.11	65.24	65.68	68.52	79.40	79.60	162.83
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	441.30	442.43	480.04	533.71	642.59	647.83	659.16	678.24	692.07	780.48	1386.44
BENEFIT/COST	G2	A	C	E	G4S	D	THRIE	B	G4W	G3	G1
VALUES	.23	.17	.14	.12	.12	.11	.10	.09	.08	.05	-.11
-4											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	THRIE	C	E	D	G3	B	G4W	G1
VALUES	37.46	57.22	57.90	58.11	61.10	62.40	63.84	64.43	75.69	75.88	156.44
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	434.97	437.93	476.37	529.58	640.88	644.17	657.32	675.69	694.36	776.59	1382.91
BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
VALUES	.24	.18	.15	.12	.12	.11	.10	.10	.09	.05	-.09
-6											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	A	G4S	C	E	G3	D	B	G4W	G1
VALUES	30.68	54.62	54.64	54.66	57.38	60.50	60.76	61.82	72.29	72.48	149.54
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	429.06	434.15	473.11	525.86	638.97	640.77	655.24	673.13	690.96	773.10	1374.24
BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
VALUES	.25	.18	.16	.12	.12	.12	.11	.10	.09	.05	-.07
-8											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	A	G4S	C	E	G3	D	B	G4W	G1
VALUES	28.54	51.74	51.99	52.14	54.27	57.71	58.36	59.61	69.36	69.55	142.11
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	420.59	432.02	470.46	522.75	636.83	637.84	653.08	670.52	688.02	770.22	1376.14
BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
VALUES	.25	.14	.14	.13	.13	.12	.11	.11	.10	.06	-.04

D-6-2

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 6-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 8 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 310.72
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

10	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	D	C	G3	G4S	A	E	B	G4W	G2	G1
VALUES	83.55	111.38	116.15	118.39	170.63	172.42	172.66	192.87	193.08	200.01	324.98
TOTAL COST	C	A	G1	G2	D	E	B	G4S	THRIE	G4W	G3
VALUES	584.62	590.90	603.46	603.48	704.85	751.14	761.35	789.11	802.02	811.56	1436.87
BENEFIT/COST	C	D	A	THRIE	G2	E	G4S	B	G4W	G3	G1
VALUES	.42	.34	.33	.32	.27	.24	.23	.21	.19	.15	-.05

10	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	D	C	G3	G4S	A	E	B	G4W	G2	G1
VALUES	80.52	106.69	110.34	113.01	165.22	167.30	167.74	186.89	187.10	192.93	325.01
TOTAL COST	C	A	G2	G1	D	E	B	G4S	THRIE	G4W	G3
VALUES	578.82	585.78	546.41	603.48	700.16	746.22	755.37	783.70	799.00	805.58	1431.48
BENEFIT/COST	C	D	A	THRIE	G2	E	G4S	B	G4W	G3	G1
VALUES	.43	.34	.34	.32	.29	.25	.24	.22	.20	.15	-.05

A.270

6	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	D	C	G3	G4S	A	E	B	G4W	G2	G1
VALUES	77.31	101.54	104.01	106.99	159.04	161.32	162.15	180.04	180.24	184.89	325.04
TOTAL COST	C	A	G2	G1	D	E	B	G4S	THRIE	G4W	G3
VALUES	572.49	579.79	588.37	603.51	695.01	740.63	748.51	777.52	795.79	798.72	1425.47
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1
VALUES	.44	.36	.35	.32	.31	.26	.25	.23	.21	.15	-.05

4	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	D	C	G3	G4S	A	E	B	G4W	G2	G1
VALUES	73.87	95.85	97.07	100.28	151.99	154.34	155.78	172.19	172.39	175.75	325.07
TOTAL COST	C	A	G2	G1	D	E	B	G4S	THRIE	G4W	G3
VALUES	565.55	572.82	579.23	603.55	689.33	734.25	740.66	770.47	790.87	792.35	1418.75
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1
VALUES	.46	.37	.36	.33	.33	.27	.26	.24	.22	.16	-.05

2	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	D	C	G3	G4S	A	E	B	G4W	G2	G1
VALUES	70.17	89.50	89.61	92.84	143.99	146.33	148.55	163.28	163.48	165.45	325.11
TOTAL COST	C	A	G2	G1	D	E	B	G4S	THRIE	G4W	G3
VALUES	557.98	564.80	568.93	603.59	683.09	727.03	731.76	762.47	781.96	788.64	1411.31
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1
VALUES	.47	.39	.37	.36	.33	.28	.27	.26	.24	.17	-.05

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 6-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 8 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 310.72

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	D	G3	G4S	A	E	B	G4W	G2	G1
VALUES	66.22	81.40	82.91	84.80	135.04	137.30	140.46	153.37	153.56	154.05	325.16
TOTAL COST	C	A	G2	G1	D	E	B	G4S	G4W	THRIE	G3
VALUES	549.88	555.77	557.53	603.63	718.38	718.94	721.84	753.54	772.04	784.69	1403.27
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.49	.41	.39	.38	.34	.29	.28	.28	.25	.17	-.05
-2											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	D	G3	G4S	A	E	G2	B	G4W	G1
VALUES	62.14	73.12	76.02	74.54	125.40	127.48	131.66	141.83	142.71	142.91	325.21
TOTAL COST	C	G2	A	G1	D	E	B	G4S	G4W	THRIE	G3
VALUES	541.60	545.31	545.96	603.68	669.50	710.13	711.19	743.88	761.38	780.61	1395.01
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.51	.44	.42	.40	.35	.31	.30	.30	.27	.18	-.05
-4											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	G4S	A	E	G2	B	G4W	G1
VALUES	58.17	65.36	68.76	64.50	115.44	117.37	122.45	129.40	131.88	132.07	325.26
TOTAL COST	G2	C	A	G1	D	B	E	G4S	G4W	THRIE	G3
VALUES	532.87	533.83	535.85	603.73	662.48	700.36	700.43	733.92	750.55	776.65	1387.24
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
VALUES	.52	.46	.45	.41	.35	.33	.32	.31	.29	.18	-.05
-6											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	G4S	A	E	G2	B	G4W	G1
VALUES	54.64	59.00	62.41	64.07	105.76	107.62	113.30	117.55	121.63	121.82	325.30
TOTAL COST	G2	A	C	G1	D	B	E	G4S	G4W	THRIE	G3
VALUES	521.03	526.09	527.47	603.77	657.54	690.11	691.77	724.24	740.24	773.12	1380.86
BENEFIT/COST	C	A	G2	D	THRIE	E	B	G4S	G4W	G3	G1
VALUES	.54	.49	.48	.42	.36	.34	.33	.33	.31	.19	-.05
-8											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	C	G3	D	G4S	A	E	G2	B	G4W	G1
VALUES	51.75	54.59	58.04	60.16	96.69	98.59	104.43	106.75	112.38	112.56	325.35
TOTAL COST	G2	A	C	G1	D	B	E	G4S	G4W	THRIE	G3
VALUES	510.22	517.06	523.07	603.81	653.63	680.85	682.90	715.17	731.04	770.23	1376.51
BENEFIT/COST	C	A	G2	D	THRIE	E	B	G4S	G4W	G3	G1
VALUES	.55	.51	.51	.42	.36	.36	.35	.35	.32	.19	-.05

A.271

D-6-2

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 6-FT SHOULDER

D-6-4

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 10 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 268.14
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10	1	2	3	4	5	6	7	8	9	10	11
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	A	THRIE	C	G3	B	G4W	G1
VALUES	68.61	71.11	73.27	74.95	79.26	80.81	86.49	88.28	98.24	98.45	263.25
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	472.09	492.74	541.73	554.96	653.43	666.71	666.75	689.59	716.92	799.29	1406.75
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
VALUES	.49	.45	.39	.33	.33	.32	.30	.27	.26	.14	.02

8	1	2	3	4	5	6	7	8	9	10	11
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	A	THRIE	C	G3	B	G4W	G1
VALUES	64.62	69.73	72.34	72.89	77.17	78.57	83.66	85.91	95.72	95.93	261.44
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	468.09	495.65	539.92	552.14	651.37	664.20	665.81	688.20	714.91	797.05	1404.38
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
VALUES	.50	.46	.39	.34	.33	.32	.30	.28	.26	.14	.02

6	1	2	3	4	5	6	7	8	9	10	11
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	G3	B	G4W	G1
VALUES	60.28	68.17	71.00	71.30	74.76	75.99	80.58	83.19	92.99	93.20	259.49
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	463.76	493.23	537.97	549.06	649.47	661.46	664.77	686.65	711.67	794.47	1401.67
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
VALUES	.52	.46	.40	.34	.33	.32	.31	.28	.27	.14	.03

4	1	2	3	4	5	6	7	8	9	10	11
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	G3	B	G4W	G1
VALUES	55.55	64.41	69.24	70.14	71.97	73.03	77.19	80.08	89.99	90.19	257.39
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	459.03	490.45	535.87	545.67	647.71	658.47	663.61	684.88	708.67	791.50	1396.55
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
VALUES	.53	.47	.41	.34	.33	.33	.31	.29	.27	.14	.04

2	1	2	3	4	5	6	7	8	9	10	11
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	G3	B	G4W	G1
VALUES	50.41	64.41	67.55	68.80	68.82	69.66	73.47	76.55	86.70	86.90	255.11
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	453.88	487.28	533.59	541.95	646.04	655.18	662.30	682.89	705.39	788.14	1395.02
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
VALUES	.54	.48	.42	.35	.34	.33	.32	.29	.28	.15	.05

A.272

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 6-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 10 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 268.14

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1 11

STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	E	THRIE	D	C	G3	B	G4W	G1
VALUES	44.45	65.19	65.29	65.92	65.94	67.34	69.45	72.65	83.14	83.34	252.63
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	448.42	483.76	531.11	537.92	644.39	651.61	660.82	680.66	701.81	784.42	1391.12
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
VALUES	.55	.48	.42	.35	.34	.33	.33	.30	.28	.15	.06

STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	THRIE	E	C	D	G3	H	G4W	G1
VALUES	39.45	59.76	61.56	62.00	64.24	65.24	65.68	68.52	79.40	79.60	249.92
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	442.43	480.04	528.34	533.71	642.71	647.88	659.16	678.24	695.07	780.48	1386.49
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
VALUES	.57	.49	.43	.35	.34	.34	.33	.30	.29	.15	.07

A.273

STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	THRIE	C	F	D	G3	H	G4W	G1
VALUES	34.46	57.22	57.90	58.11	61.10	62.46	63.84	64.43	75.69	75.88	246.93
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	437.93	476.37	525.40	529.58	640.93	644.17	657.32	675.69	694.36	775.59	1362.91
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
VALUES	.59	.50	.44	.36	.34	.34	.34	.31	.29	.15	.08

STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	A	G4S	C	E	G3	D	B	G4W	G1
VALUES	30.68	54.62	54.64	54.66	57.38	60.52	60.76	61.82	72.29	72.48	243.62
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	434.15	473.11	522.09	525.86	638.99	640.77	655.29	673.13	690.96	773.10	1379.24
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
VALUES	.59	.51	.45	.36	.35	.35	.34	.32	.30	.16	.09

STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	THRIE	A	G4S	C	G3	E	D	B	G4W	G1
VALUES	28.54	51.74	51.99	52.14	54.27	57.71	58.36	59.61	69.36	69.55	239.96
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	452.02	470.46	518.43	522.75	636.84	637.84	653.08	670.62	688.02	770.22	1376.19
BENEFIT/COST	G2	A	C	E	D	B	G4S	G4W	THRIE	G3	G1
VALUES	.59	.52	.46	.36	.35	.35	.35	.32	.30	.16	.10

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D-6-6

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 6-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 231.79
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	B	G4W	G1
VALUES	31.85	71.12	72.35	73.28	79.29	80.78	86.46	88.28	98.42	186.56
TOTAL COST	G2	G1	A	C	E	B	D	G4S	THRIE	G3
VALUES	435.33	465.03	497.76	554.94	650.83	666.69	666.76	689.60	799.26	1406.75
BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1	G3
VALUES	.50	.36	.31	.28	.27	.26	.23	.22	.16	.11

8 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	B	G4W	G1
VALUES	31.46	69.73	71.03	72.34	77.18	78.56	83.65	85.91	95.71	183.88
TOTAL COST	G2	G1	A	C	E	B	D	G4S	THRIE	G3
VALUES	434.93	462.35	495.65	552.13	649.51	664.19	665.81	688.21	797.04	1404.38
BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1	G3
VALUES	.50	.37	.32	.28	.27	.26	.24	.22	.17	.11

6 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	B	G4W	G1
VALUES	31.08	68.17	69.74	71.30	74.76	75.99	80.58	83.19	93.19	180.75
TOTAL COST	G2	G1	A	C	E	B	D	G4S	THRIE	G3
VALUES	434.56	459.23	493.24	549.06	648.21	661.46	664.78	686.65	794.46	1401.67
BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1	G3
VALUES	.50	.38	.32	.28	.27	.26	.24	.22	.18	.11

4 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	B	G4W	G1
VALUES	30.72	66.41	68.43	70.14	71.97	73.02	77.19	80.08	89.99	177.11
TOTAL COST	G2	G1	A	C	E	B	D	G4S	THRIE	G3
VALUES	434.19	455.58	490.45	545.67	646.91	658.47	663.61	684.88	791.50	1398.55
BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1	G3
VALUES	.50	.38	.33	.28	.27	.26	.25	.22	.20	.12

2 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	F	A	D	THRIE	C	B	G4W	G1
VALUES	30.35	69.41	67.08	68.80	68.82	69.66	73.47	76.55	86.70	172.87
TOTAL COST	G2	G1	A	C	E	B	D	G4S	THRIE	G3
VALUES	433.82	451.34	487.28	541.95	645.56	655.18	662.30	682.89	788.14	1395.02
BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1	G3
VALUES	.50	.39	.34	.28	.27	.26	.26	.23	.21	.12

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 6-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 231.79

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	VALUES	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G4S	A	THRIE	D	C	G3	B	G4W	G1		
29.96	VALUES	62.19	65.29	65.66	65.94	67.34	69.45	72.65	83.14	83.34	167.97	
	TOTAL COST	G1	A	E	D	B	D	G4S	G4W	THRIE	G3	
433.44	VALUES	446.45	483.76	537.92	644.13	651.61	660.82	680.66	701.81	784.42	1351.12	
	BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1	G3
.50	VALUES	.40	.35	.29	.28	.27	.26	.24	.23	.23	.12	

-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	VALUES	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G4S	A	THRIE	E	C	G3	B	G4W	G1		
29.55	VALUES	59.76	61.56	62.00	64.11	65.24	65.68	68.52	79.40	79.60	162.40	
	TOTAL COST	G1	A	C	E	B	D	G4S	G4W	THRIE	G3	
433.03	VALUES	440.87	480.04	533.71	642.59	647.88	659.16	678.24	698.07	780.48	1386.99	
	BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	
.50	VALUES	.41	.36	.29	.28	.28	.27	.25	.25	.24	.12	

A.275

-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	VALUES	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G4S	A	THRIE	C	E	G3	B	G4W	G1		
29.12	VALUES	57.22	57.90	58.11	61.10	62.40	63.84	64.43	75.69	75.88	156.17	
	TOTAL COST	G1	A	C	E	B	D	G4S	G4W	THRIE	G3	
432.59	VALUES	434.64	476.37	529.58	640.88	644.17	657.32	675.69	694.36	776.59	1382.91	
	BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	
.50	VALUES	.42	.36	.29	.28	.28	.27	.27	.25	.24	.13	

-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	VALUES	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G4S	A	THRIE	C	E	G3	B	G4W	G1		
28.65	VALUES	54.62	54.64	54.66	57.38	60.50	60.76	61.82	72.29	72.49	149.35	
	TOTAL COST	G1	A	C	E	B	D	G4S	G4W	THRIE	G3	
427.82	VALUES	432.12	473.11	525.86	638.97	640.77	655.29	673.13	690.96	773.10	1379.24	
	BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	
.50	VALUES	.42	.37	.30	.30	.29	.29	.28	.26	.25	.13	

-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	VALUES	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G4S	A	THRIE	C	E	G3	B	G4W	G1		
28.14	VALUES	51.74	51.99	52.14	54.27	57.71	58.36	59.61	69.36	69.55	141.93	
	TOTAL COST	G1	A	C	E	B	D	G4S	G4W	THRIE	G3	
420.40	VALUES	431.62	470.46	522.75	636.83	637.84	653.08	670.62	688.02	770.22	1376.19	
	BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	
.50	VALUES	.43	.38	.32	.30	.29	.29	.29	.26	.25	.13	

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SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 6-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 200.67
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	G1	E	D	A	THRIE	C	G3	B	G4W
VALUES	31.85	71.09	71.49	72.33	73.25	74.29	80.78	86.46	88.28	98.21	48.42
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	350.47	475.33	497.76	554.94	650.81	664.69	666.73	689.57	716.90	799.26	1406.75
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.46	.42	.29	.24	.22	.22	.21	.18	.17	.17	.09
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	E	D	A	THRIE	C	G3	B	G4W
VALUES	31.46	68.05	69.72	71.03	72.33	77.18	78.56	83.65	85.91	95.71	95.92
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	346.53	474.93	495.66	552.13	649.50	664.19	665.80	688.20	714.40	797.04	1404.38
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.48	.42	.30	.25	.22	.22	.21	.18	.17	.17	.09
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	E	D	A	THRIE	C	G3	B	G4W
VALUES	31.08	63.79	68.17	69.74	71.30	74.76	75.99	80.58	83.19	92.99	93.19
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	342.26	474.56	493.24	549.06	648.21	661.46	664.77	686.64	711.67	794.46	1401.67
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.49	.42	.30	.26	.23	.22	.21	.19	.17	.17	.09
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	E	D	A	THRIE	C	G3	B	G4W
VALUES	30.72	59.14	66.41	68.43	70.13	71.97	73.02	77.19	80.08	89.99	90.19
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	337.61	474.19	490.45	545.67	646.91	658.17	663.61	684.88	708.67	791.50	1396.55
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.51	.42	.31	.26	.23	.22	.22	.20	.18	.18	.09
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	E	D	A	THRIE	C	G3	B	G4W
VALUES	30.35	54.09	64.41	67.08	68.80	68.82	69.66	73.47	76.55	86.70	86.90
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	332.57	473.82	487.28	541.95	645.56	655.18	662.30	682.89	705.38	788.14	1395.02
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.53	.42	.32	.27	.23	.22	.22	.20	.18	.18	.09

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 6-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 200.87

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA												
DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11	
0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	A	E	THRIE	D	C	G3	B	G4W
	VALUES	29.96	48.75	62.19	65.29	65.66	65.94	67.34	69.45	72.65	83.14	83.34
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	327.23	433.44	483.76	537.92	644.13	651.61	660.82	680.66	701.81	784.42	1391.12
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
	VALUES	.55	.42	.32	.28	.23	.22	.21	.21	.19	.19	.10
-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	A	THRIE	E	C	D	G3	B	G4W
	VALUES	29.55	43.39	59.76	61.56	62.00	64.11	65.24	65.68	68.52	79.40	79.60
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	321.87	433.03	480.04	533.71	642.59	647.88	659.16	678.24	698.07	780.48	1386.94
	BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
	VALUES	.57	.42	.33	.29	.24	.23	.23	.21	.20	.19	.10
-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	A	THRIE	C	E	D	G3	B	G4W
	VALUES	29.12	38.56	57.22	57.90	58.11	61.10	62.40	63.84	64.43	75.69	75.88
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	317.03	432.59	476.37	529.58	640.88	644.17	657.32	675.69	694.36	776.59	1382.91
	BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
	VALUES	.58	.43	.34	.30	.24	.23	.23	.22	.20	.20	.10
-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	THRIE	A	G4S	C	E	G3	D	B	G4W
	VALUES	28.45	34.94	54.62	54.64	54.66	57.38	60.50	60.76	61.82	72.29	72.48
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	313.42	432.12	473.11	525.86	638.97	640.77	655.29	673.13	690.96	773.10	1375.24
	BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
	VALUES	.60	.43	.35	.31	.24	.24	.23	.23	.21	.20	.11
-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	THRIE	A	G4S	C	G3	D	E	B	G4W
	VALUES	28.14	32.98	51.74	51.99	52.14	54.27	57.71	58.36	59.61	69.36	69.55
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	311.46	431.62	470.46	522.75	636.83	637.84	653.08	670.62	688.02	770.22	1376.19
	BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
	VALUES	.60	.43	.36	.31	.25	.24	.24	.23	.21	.21	.11

A.277

A.277

D-6-8

D-6-10

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 6-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 174.68

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	E	D	A	THRIE	C	B	G4W
	VALUES	31.82	37.48	71.09	72.33	73.25	79.29	80.78	86.46	88.28	98.21
	TOTAL COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	315.95	435.30	497.76	554.94	650.81	666.69	669.73	716.90	799.26	1406.75
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
	VALUES	.49	.35	.23	.19	.18	.17	.17	.13	.12	.07

8	STATE COST	G1	G2	A	C	R	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	E	D	A	THRIE	C	B	G4W
	VALUES	31.45	36.40	69.72	71.03	72.33	77.18	78.56	83.65	85.91	95.71
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	314.87	434.42	495.66	552.13	649.50	664.19	665.80	714.40	797.04	1404.38
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
	VALUES	.50	.35	.23	.19	.18	.17	.17	.14	.13	.07

6	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	E	D	A	THRIE	C	B	G4W
	VALUES	31.08	35.51	68.17	69.74	71.30	74.76	75.99	80.58	83.19	93.19
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	313.99	434.56	493.24	549.06	648.21	661.46	664.77	711.67	794.46	1401.67
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
	VALUES	.50	.36	.24	.20	.18	.17	.17	.14	.13	.07

4	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	276.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	E	D	A	THRIE	C	B	G4W
	VALUES	30.72	34.81	66.41	68.43	70.13	71.97	73.02	77.19	80.08	90.19
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	313.29	434.19	490.45	545.67	646.91	659.47	663.61	708.67	791.50	1348.55
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
	VALUES	.50	.36	.25	.21	.18	.18	.18	.14	.14	.07

2	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	E	A	D	THRIE	C	B	G4W
	VALUES	30.35	34.26	64.41	67.08	68.80	68.82	69.66	73.47	76.55	86.90
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	312.74	433.82	487.28	541.95	645.56	655.18	662.30	705.38	788.14	1355.02
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G3
	VALUES	.50	.36	.25	.22	.19	.18	.18	.15	.14	.07

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 6-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 174.68

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	A	E	THRIE	D	C	G3	B	G4W
VALUES	29.46	33.84	62.19	65.29	65.66	65.94	67.34	69.45	72.65	83.14	83.34
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	312.31	433.44	483.76	533.72	634.13	651.61	660.82	680.66	701.81	780.42	1391.12
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
VALUES	.51	.36	.26	.22	.19	.18	.18	.16	.15	.15	.08
-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G2
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	A	THRIE	E	C	D	G3	B	G4W
VALUES	29.55	33.50	59.76	61.56	62.00	64.11	65.24	65.68	68.52	79.40	74.60
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	311.97	433.03	480.04	533.71	632.59	647.88	659.16	678.24	694.07	780.48	1386.99
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
VALUES	.51	.36	.27	.23	.19	.19	.18	.17	.16	.15	.08
-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	A	THRIE	C	E	D	G3	B	G4W
VALUES	29.12	33.20	57.22	57.90	58.11	61.10	62.40	63.84	64.43	75.69	75.88
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	311.67	432.59	476.37	529.58	630.88	644.17	657.32	675.69	694.36	776.59	1382.91
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
VALUES	.51	.36	.28	.24	.19	.19	.19	.17	.16	.16	.08
-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	THRIE	A	G4S	C	E	D	G3	B	G4W
VALUES	28.65	32.90	54.62	54.64	54.66	57.38	60.50	60.76	61.82	72.29	72.48
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	311.38	432.12	473.11	525.86	638.97	640.77	655.29	673.13	690.96	773.10	1379.24
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
VALUES	.51	.36	.29	.25	.20	.19	.19	.18	.17	.17	.09
-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	THRIE	A	G4S	C	E	D	G3	B	G4W
VALUES	28.14	32.58	51.74	51.99	52.14	54.27	57.71	58.36	59.61	69.36	69.55
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	311.06	431.62	470.46	522.75	636.83	637.84	653.08	670.62	689.02	770.22	1376.19
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
VALUES	.51	.36	.29	.26	.20	.20	.19	.19	.17	.17	.09

A.279

D-6-10

D-6-12

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 6-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 18 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 152.56
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G4S	E	D	A	THRIE	C	G3	G3	G3	B	G4W
VALUES	31.82	34.19	71.09	72.33	73.25	79.29	80.78	86.46	88.25	88.25	98.21	98.42
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	G4W	THRIE	G3
VALUES	312.66	435.30	497.76	554.94	650.81	666.69	666.73	689.57	716.90	716.90	799.26	1406.72
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	THRIE	G4W	G3
VALUES	.43	.30	.18	.14	.14	.13	.13	.10	.10	.10	.09	.05

8	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G4S	E	D	A	THRIE	C	G3	G3	G3	B	G4W
VALUES	31.45	34.05	69.72	71.03	72.33	77.18	78.56	83.65	85.90	85.90	95.71	95.92
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	G4W	THRIE	G3
VALUES	312.53	434.92	495.66	552.13	649.50	664.19	665.80	688.20	714.40	714.40	797.04	1404.37
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	THRIE	G4W	G3
VALUES	.43	.30	.18	.15	.14	.14	.13	.10	.10	.10	.09	.05

6	STATE COST	G1	G2	A	C	H	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G4S	E	D	A	THRIE	C	G3	G3	G3	B	G4W
VALUES	31.08	33.93	68.17	69.74	71.30	74.76	75.99	80.58	83.19	83.19	92.99	93.19
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	G4W	THRIE	G3
VALUES	312.40	434.56	493.24	549.06	648.21	661.46	664.77	686.64	711.67	711.67	794.46	1401.66
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	THRIE	G4W	G3
VALUES	.43	.30	.19	.15	.14	.14	.14	.11	.10	.10	.10	.05

4	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G4S	E	D	A	THRIE	C	G3	G3	G3	B	G4W
VALUES	30.72	33.80	66.41	68.43	70.13	71.97	73.02	77.19	80.07	80.07	89.99	90.19
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	G4W	THRIE	G3
VALUES	312.27	434.19	490.45	545.67	646.91	658.47	663.61	684.88	708.67	708.67	791.50	1398.55
BENEFIT/COST	G1	G2	A	C	E	G4S	D	THRIE	B	THRIE	G4W	G3
VALUES	.43	.30	.19	.16	.15	.14	.14	.11	.11	.10	.10	.05

2	STATE COST	G1	G2	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G4S	E	D	A	THRIE	C	G3	G3	G3	B	G4W
VALUES	30.35	33.66	69.41	67.08	68.80	68.82	69.66	73.47	76.55	76.55	86.70	86.90
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	G4W	THRIE	G3
VALUES	312.14	433.82	487.28	541.95	645.56	655.18	662.30	682.89	705.38	705.38	788.14	1395.02
BENEFIT/COST	G1	G2	A	C	E	G4S	D	THRIE	B	THRIE	G4W	G3
VALUES	.43	.30	.20	.17	.15	.14	.14	.12	.12	.11	.11	.06

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 6-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 18 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 152.56
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

0 STATE COST
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST
 VALUES 29.96 33.51 62.14 65.29 65.66 65.94 67.34 69.45 72.65 83.14 83.34
 TOTAL COST
 VALUES 311.98 433.44 483.76 537.92 634.13 651.61 660.82 680.66 701.81 784.42 1391.12
 BENEFIT/COST
 VALUES .43 .30 .21 .18 .15 .15 .14 .12 .12 .11 .06

-2 STATE COST
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST
 VALUES 29.55 33.34 59.76 61.56 62.00 64.11 65.24 65.68 68.52 79.40 74.60
 TOTAL COST
 VALUES 311.81 433.03 480.04 533.71 630.48 647.88 659.16 678.24 694.07 780.48 1386.49
 BENEFIT/COST
 VALUES .43 .30 .22 .19 .15 .15 .15 .13 .13 .12 .06

A.281

-4 STATE COST
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST
 VALUES 29.12 33.13 57.22 57.90 58.11 61.10 62.40 63.84 64.43 75.69 75.88
 TOTAL COST
 VALUES 311.61 432.59 476.37 529.58 630.88 644.17 657.32 675.69 694.36 776.59 1392.91
 BENEFIT/COST
 VALUES .43 .31 .23 .20 .16 .15 .15 .14 .13 .12 .07

-6 STATE COST
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST
 VALUES 28.65 32.88 54.62 54.64 54.66 57.38 60.50 60.76 61.82 72.29 72.48
 TOTAL COST
 VALUES 311.35 432.12 473.11 525.86 638.97 640.77 655.29 673.13 690.46 773.10 1379.24
 BENEFIT/COST
 VALUES .43 .31 .23 .20 .16 .16 .15 .14 .14 .13 .07

-8 STATE COST
 VALUES 278.48 403.48 418.48 468.48 568.48 578.48 593.48 618.48 618.48 718.48 1318.48
 SOCIETAL COST
 VALUES 28.14 32.57 51.74 51.99 52.14 54.27 57.71 58.36 59.61 69.36 69.55
 TOTAL COST
 VALUES 311.05 431.62 470.46 522.75 636.83 637.84 653.08 670.62 688.02 770.22 1376.19
 BENEFIT/COST
 VALUES .43 .31 .24 .21 .16 .16 .16 .15 .15 .13 .07

D-6-12

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ EMBANKMENT HINGE AT 7 FT

D-7-0

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 7 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 121.78

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE
OF CURVE

1	2	3	4	5	6	7	8	9	10	11
10	STATE COST	G1	G2	A	C	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G4S	G2	D	E	A	THRIE	C	G3	G1
	VALUES	69.42	20.64	20.84	21.47	77.10	86.34	86.44	96.79	182.34
	TOTAL COST	G1	G2	A	C	D	B	G4S	THRIE	G3
	VALUES	460.82	474.12	495.57	554.81	649.44	665.27	687.84	715.47	1404.92
	BENEFIT/COST	G2	A	E	D	G4S	THRIE	B	G3	G1
	VALUES	.13	.11	.09	.09	.08	.06	.04	.03	-.22
8	STATE COST	G1	G2	A	C	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	G4W	G1
	VALUES	66.70	68.25	69.99	70.05	75.37	77.42	84.51	44.42	174.62
	TOTAL COST	G1	G2	A	C	E	D	G4S	THRIE	G3
	VALUES	458.10	470.18	493.85	552.16	648.47	663.90	686.73	713.10	1402.99
	BENEFIT/COST	G2	A	E	D	G4S	THRIE	B	G3	G1
	VALUES	.14	.11	.09	.09	.09	.06	.05	.04	-.21
6	STATE COST	G1	G2	A	C	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	G4W	G1
	VALUES	62.48	56.47	68.60	64.21	73.37	75.35	80.84	41.89	176.62
	TOTAL COST	G1	G2	A	C	E	D	G4S	THRIE	G3
	VALUES	455.10	465.96	491.95	549.32	647.07	660.37	685.45	710.57	1400.76
	BENEFIT/COST	G2	A	E	D	G4S	THRIE	B	G3	G1
	VALUES	.15	.12	.09	.09	.09	.06	.05	.03	-.20
4	STATE COST	G1	G2	A	C	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	G4W	G1
	VALUES	57.91	55.53	67.26	58.28	71.03	72.90	79.64	84.15	173.27
	TOTAL COST	G1	G2	A	C	E	D	G4S	THRIE	G3
	VALUES	451.74	461.38	489.50	546.22	645.74	657.62	684.00	707.82	1398.17
	BENEFIT/COST	G2	A	E	D	G4S	THRIE	B	G3	G1
	VALUES	.16	.12	.09	.09	.09	.07	.06	.05	-.18
2	STATE COST	G1	G2	A	C	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	G4W	G1
	VALUES	52.90	63.87	65.94	67.23	68.28	70.03	74.33	86.13	169.48
	TOTAL COST	G1	G2	A	C	E	D	G4S	THRIE	G3
	VALUES	447.95	456.37	486.76	542.80	644.42	654.61	680.71	704.80	1395.14
	BENEFIT/COST	G2	A	E	D	G4S	THRIE	B	G3	G1
	VALUES	.17	.13	.10	.10	.09	.07	.06	.03	-.17

A.282

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ EMBANKMENT HINGE AT 7 FT

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 7 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 121.78

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE

0 STATE COST

VALUES

SOCIETAL COST

VALUES

TOTAL COST

VALUES

BENEFIT/COST

VALUES

1	2	3	4	5	6	7	8	9	10	11
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
G4S	G4S	E	A	D	THRIE	C	G3	B	G4W	G1
47.44	61.97	64.61	65.11	66.03	66.71	70.56	73.18	82.81	83.00	165.17
G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
443.65	450.91	483.59	539.03	643.09	651.29	659.51	680.44	701.48	785.18	1391.65
G2	A	C	E	G4S	D	THRIE	B	G4W	G3	G1
.19	.14	.11	.10	.10	.09	.08	.07	.06	.04	.16

1	2	3	4	5	6	7	8	9	10	11
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
G4S	G4S	E	A	D	THRIE	C	G3	B	G4W	G1
41.66	54.83	61.57	63.00	63.23	64.66	66.48	69.29	79.22	79.40	160.28
G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
438.76	445.13	480.05	539.95	641.71	647.69	658.14	678.30	697.88	781.48	1387.76
G2	A	C	E	G4S	D	THRIE	B	G4W	G3	G1
.20	.14	.12	.10	.10	.10	.08	.07	.07	.04	.14

A.283

1	2	3	4	5	6	7	8	9	10	11
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
G4S	G4S	E	A	D	THRIE	C	G3	B	G4W	G1
35.95	57.49	57.85	59.10	61.75	62.27	63.11	65.20	75.49	75.67	154.76
G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
433.26	439.42	476.33	530.74	640.23	643.97	656.59	675.97	694.15	772.58	1383.68
G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
.21	.15	.13	.10	.10	.10	.09	.08	.07	.04	.12

1	2	3	4	5	6	7	8	9	10	11
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
G4S	G4S	E	A	D	THRIE	C	G3	B	G4W	G1
31.07	54.33	55.08	55.39	58.29	60.12	61.30	61.38	71.93	72.11	148.73
G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
427.20	434.54	472.81	526.76	638.60	640.40	654.85	673.56	690.58	773.86	1379.77
G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
.22	.16	.14	.11	.11	.10	.09	.09	.08	.05	.10

1	2	3	4	5	6	7	8	9	10	11
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
G4S	G4S	E	A	D	THRIE	C	G3	B	G4W	G1
27.88	51.43	52.29	52.72	54.96	58.03	58.29	59.47	68.86	69.04	142.17
G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
420.65	431.35	469.91	523.43	636.77	637.34	652.94	671.19	687.51	770.76	1376.51
G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
.23	.17	.14	.11	.11	.10	.10	.09	.09	.05	.07

D-7-0

D-7-2

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 7-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT	GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT
PAVEMENT-TO-OBSTACLE DISTANCE = 9 FT	SOCIETAL COST WITH NO GUARDRAIL = \$ 288.60
ADAY = 1000	GUARDRAIL LENGTH = 100 FT
	OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE		PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA											
		1	2	3	4	5	6	7	8	9	10	11	
10	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3	
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48	
	SOCIETAL COST	THRIE	D	C	G3	A	G4S	E	B	G4W	G2	G1	
	VALUES	84.38	113.23	118.91	119.49	168.10	169.03	170.34	190.26	190.46	201.09	301.72	
	TOTAL COST	G1	A	C	G2	D	E	B	G4S	THRIE	G4W	G3	
	VALUES	580.24	586.57	587.39	604.57	706.70	748.62	758.74	787.50	802.86	808.94	1437.96	
	BENEFIT/COST	C	D	A	THRIE	G2	E	G4S	B	G4W	G3	G1	
	VALUES	.36	.30	.29	.28	.22	.20	.19	.17	.16	.13	-.05	
	8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
		VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST		THRIE	D	C	G3	A	G4S	E	B	G4W	G2	G1	
VALUES		81.35	108.78	113.35	114.62	164.12	164.49	166.21	185.30	185.50	195.35	301.72	
TOTAL COST		G1	C	A	G2	D	E	B	G4S	THRIE	G4W	G3	
	VALUES	580.27	581.62	582.59	598.82	702.25	744.68	753.77	782.97	799.82	803.97	1433.04	
	BENEFIT/COST	C	D	A	THRIE	G2	E	G4S	B	G4W	G3	G1	
	VALUES	.37	.30	.30	.29	.23	.21	.20	.18	.17	.13	-.05	
	6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
		VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST		THRIE	D	C	G3	G4S	A	E	B	G4W	G2	G1	
VALUES		78.20	103.93	107.34	109.19	159.31	159.38	161.51	174.57	179.76	188.74	301.82	
TOTAL COST		C	A	G1	G2	D	E	B	G4S	THRIE	G4W	G3	
	VALUES	575.62	577.86	580.24	592.22	647.41	739.88	748.04	777.78	796.67	798.24	1427.67	
	BENEFIT/COST	C	D	A	THRIE	G2	E	G4S	B	G4W	G3	G1	
	VALUES	.39	.31	.31	.29	.25	.22	.21	.19	.18	.14	-.05	
	4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
		VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST		THRIE	D	C	G3	G4S	A	E	B	G4W	G2	G1	
VALUES		74.87	98.60	100.79	103.10	153.34	153.74	156.13	172.92	173.12	181.13	301.85	
TOTAL COST		C	A	G1	G2	D	E	B	G4S	THRIE	G4W	G3	
	VALUES	569.27	572.21	580.33	584.60	642.08	734.60	741.40	771.82	791.60	793.35	1421.57	
	BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1	
	VALUES	.40	.32	.32	.30	.27	.23	.22	.20	.19	.14	-.05	
	2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
		VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST		THRIE	D	C	G3	G4S	A	E	B	G4W	G2	G1	
VALUES		71.31	92.69	93.59	96.23	146.46	147.05	149.94	165.23	165.42	172.34	301.84	
TOTAL COST		C	A	G2	G1	D	E	B	G4S	THRIE	G4W	G3	
	VALUES	562.06	565.53	575.82	580.37	686.17	728.42	733.70	764.94	783.90	789.79	1414.71	
	BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1	
	VALUES	.42	.34	.33	.30	.29	.24	.23	.22	.20	.15	-.05	

A.284

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 7-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 9 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 288.60

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA												
DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11	
0	STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4W 618.48	G4S 618.48	THRIE 718.48	G3 1318.48
	SOCIETAL COST VALUES	THRIE 67.49	C 85.70	D 86.19	G3 88.56	G4S 138.58	A 139.24	E 142.87	B 156.40	G4W 156.59	G2 162.31	G1 301.94
	TOTAL COST VALUES	C 554.18	A 557.72	G2 565.78	G1 580.42	D 679.66	E 721.34	B 724.87	G4S 757.06	G4W 775.06	THRIE 785.46	G3 1407.04
	BENEFIT/COST VALUES	C .43	A .36	D .34	G2 .31	THRIE .31	E .25	G4S .24	B .23	G4W .21	G3 .15	G1 -.05
-2	STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4W 618.48	G4S 618.48	THRIE 718.48	G3 1318.48
	SOCIETAL COST VALUES	THRIE 63.43	C 77.28	D 79.20	G3 80.26	G4S 129.74	A 130.37	E 134.91	B 146.52	G4W 146.71	G2 151.11	G1 302.00
	TOTAL COST VALUES	C 545.75	A 548.65	G2 554.58	G1 580.47	D 672.67	E 713.34	B 715.00	G4S 748.22	G4W 765.18	THRIE 781.41	G3 1348.74
	BENEFIT/COST VALUES	C .45	A .38	D .35	G2 .34	THRIE .31	E .27	G4S .26	B .25	G4W .23	G3 .16	G1 -.05
-4	STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4W 618.48	G4S 618.48	THRIE 718.48	G3 1318.48
	SOCIETAL COST VALUES	THRIE 59.32	C 68.82	D 71.86	G3 72.13	G4S 120.24	A 120.78	E 126.30	B 135.99	G4W 135.17	G2 139.16	G1 302.06
	TOTAL COST VALUES	C 537.29	A 539.26	G2 542.64	G1 580.53	D 665.60	E 704.46	B 704.77	G4S 738.72	G4W 754.65	THRIE 772.79	G3 1340.33
	BENEFIT/COST VALUES	C .47	A .40	D .37	G2 .36	THRIE .32	E .28	G4S .27	B .27	G4W .25	G3 .16	G1 -.05
-6	STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4W 618.48	G4S 618.48	THRIE 718.48	G3 1318.48
	SOCIETAL COST VALUES	THRIE 55.48	C 61.27	D 64.33	G3 65.75	G4S 110.70	A 111.16	E 117.44	B 125.60	G4W 125.78	G2 127.32	G1 302.12
	TOTAL COST VALUES	C 529.64	A 529.75	G2 530.80	G1 580.59	D 659.23	E 694.07	B 695.97	G4S 729.18	G4W 744.25	THRIE 773.45	G3 1382.81
	BENEFIT/COST VALUES	C .49	A .42	D .40	G2 .38	THRIE .32	E .30	G4S .29	B .29	G4W .26	G3 .17	G1 -.05
-8	STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4W 618.48	G4S 618.48	THRIE 718.48	G3 1318.48
	SOCIETAL COST VALUES	THRIE 52.32	C 55.75	D 58.84	G3 60.94	G4S 101.83	A 102.31	E 109.04	B 116.27	G4W 116.45	G2 116.57	G1 302.16
	TOTAL COST VALUES	G2 520.05	A 520.79	C 524.22	G1 580.64	D 654.42	B 684.75	E 687.51	G4S 720.30	G4W 734.92	THRIE 770.79	G3 1372.31
	BENEFIT/COST VALUES	C .50	A .45	G2 .43	D .38	THRIE .33	E .31	B .30	G4S .30	G4W .28	G3 .17	G1 -.05

A.285

A.285

D-7-2

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 7-FT SHOULDER

D-7-4

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 11 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 249,24
 ADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	E	A	THRIE	C	G3	B	G4W	G1
VALUES	69.38	70.64	70.82	76.32	77.10	79.27	86.34	86.44	96.99	252.31
TOTAL COST	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	474.12	495.57	530.79	554.81	654.80	664.29	665.27	715.47	797.75	1404.92
BENEFIT/COST	G2	A	D	E	G4S	B	G4W	THRIE	G3	G1
VALUES	.44	.41	.35	.30	.29	.27	.25	.24	.12	-.01
8 STATE COST	G1	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	D	E	A	THRIE	C	G3	B	G4W	G1
VALUES	66.70	68.24	70.04	73.68	75.37	77.46	83.64	84.51	94.42	250.86
TOTAL COST	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	470.18	493.85	529.33	552.16	652.16	662.90	663.52	713.10	795.94	1402.94
BENEFIT/COST	G2	A	C	E	G4S	B	G4W	THRIE	G3	G1
VALUES	.45	.42	.35	.30	.29	.27	.25	.24	.12	-.01
6 STATE COST	G1	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	D	E	A	THRIE	C	G3	B	G4W	G1
VALUES	62.48	66.97	69.20	71.29	73.37	75.36	80.84	82.29	91.89	248.28
TOTAL COST	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	465.46	491.85	527.76	549.32	644.77	650.37	662.68	685.44	710.57	1400.76
BENEFIT/COST	G2	A	C	E	G4S	B	G4W	THRIE	G3	G1
VALUES	.46	.42	.36	.31	.30	.29	.28	.25	.13	-.00
4 STATE COST	G1	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	D	E	A	THRIE	C	G3	B	G4W	G1
VALUES	57.91	65.53	68.28	69.13	71.03	72.91	77.74	79.69	89.15	247.57
TOTAL COST	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	461.78	489.50	526.05	546.22	647.61	657.62	661.75	684.00	707.82	1398.17
BENEFIT/COST	G2	A	C	E	G4S	B	G4W	THRIE	G3	G1
VALUES	.47	.43	.37	.31	.30	.28	.26	.25	.13	.01
2 STATE COST	G1	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	F	D	A	THRIE	C	G3	B	G4W	G1
VALUES	52.90	63.87	67.16	67.23	68.28	70.03	74.33	76.66	86.13	245.71
TOTAL COST	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	456.37	486.76	524.19	542.80	645.64	654.61	660.71	682.34	704.80	1395.14
BENEFIT/COST	G2	A	C	E	G4S	B	G4W	THRIE	G3	G1
VALUES	.49	.43	.37	.31	.30	.29	.26	.25	.13	.01

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 7-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 11 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 249.24
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	E	D	THRIE	C	G3	B	G4W	G1
VALUES	47.44	61.97	65.11	65.35	66.03	66.71	70.56	73.18	82.81	83.00	243.67
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	450.91	483.59	522.15	534.03	643.83	651.29	654.51	680.44	701.48	785.18	1391.65
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
VALUES	.50	.44	.38	.32	.31	.30	.29	.27	.25	.13	.02

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	THRIE	E	D	C	G3	B	G4W	G1
VALUES	41.66	59.83	61.57	63.00	63.64	64.66	66.48	69.29	79.22	79.40	241.42
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	445.13	480.05	519.90	534.95	642.12	647.69	658.14	678.30	697.88	781.48	1387.76
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
VALUES	.51	.45	.39	.32	.31	.31	.30	.27	.26	.14	.03

A.287

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	THRIE	E	C	D	G3	R	G4W	G1
VALUES	35.95	57.44	57.85	59.10	61.95	62.27	63.11	65.20	75.49	75.67	238.92
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	439.42	476.33	517.39	530.74	640.43	643.97	656.59	675.97	694.15	777.58	1383.68
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
VALUES	.53	.46	.40	.32	.31	.31	.31	.28	.26	.14	.04

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	G4S	THRIE	C	E	G3	D	B	G4W	G1
VALUES	31.07	54.33	55.08	55.39	58.29	60.21	61.30	61.38	71.93	72.11	236.11
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	434.54	472.81	514.59	526.76	638.68	640.40	654.85	673.56	690.58	773.86	1379.72
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
VALUES	.54	.47	.41	.33	.32	.31	.31	.29	.27	.14	.05

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	THRIE	G4S	C	G3	E	D	B	G4W	G1
VALUES	27.88	51.43	52.29	52.72	54.96	58.03	58.32	54.47	68.86	64.04	232.94
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	431.35	469.91	511.42	523.43	636.80	637.34	652.94	671.19	687.51	770.76	1376.51
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
VALUES	.55	.47	.41	.33	.32	.32	.32	.29	.27	.15	.06

D-7-4

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 7-FT SHOULDER

D-7-6

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 5 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 13 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 215.70

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1 2 3 4 5 6 7 8 9 10 11

10 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	A	THRIE	C	B	G4W	G1
VALUES	30.68	69.42	70.84	71.47	77.18	79.18	86.24	86.44	96.70	178.00
TOTAL COST	G2	G1	A	C	E	D	B	G4S	THRIE	G3
VALUES	434.16	455.48	495.66	554.72	649.44	664.32	665.18	687.89	715.38	1404.92
BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1	G3
VALUES	.46	.33	.28	.25	.24	.24	.21	.19	.14	.10

8 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	B	G4W	G1
VALUES	30.18	69.25	69.99	70.05	75.41	72.42	83.65	84.51	94.39	176.01
TOTAL COST	G2	G1	A	C	E	D	B	G4S	THRIE	G3
VALUES	433.65	454.48	493.88	552.12	648.47	642.86	663.53	686.73	713.06	1402.99
BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1	G3
VALUES	.46	.34	.28	.25	.25	.24	.21	.20	.14	.10

6 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	B	G4W	G1
VALUES	29.73	66.47	68.60	69.21	73.38	75.35	80.83	82.29	91.88	173.65
TOTAL COST	G2	G1	A	C	E	D	B	G4S	THRIE	G3
VALUES	433.21	452.12	491.86	549.31	647.07	660.36	662.68	685.45	710.55	1400.76
BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1	G3
VALUES	.46	.34	.29	.25	.25	.24	.22	.20	.15	.10

4 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	B	G4W	G1
VALUES	29.32	65.53	67.26	68.28	71.03	72.90	77.74	79.69	89.15	170.85
TOTAL COST	G2	G1	A	C	E	D	B	G4S	THRIE	G3
VALUES	432.80	449.33	489.51	546.22	645.74	657.62	661.76	684.00	707.82	1398.17
BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1	G3
VALUES	.46	.35	.29	.26	.25	.24	.22	.20	.16	.10

2 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	F	D	A	THRIE	C	B	G4W	G1
VALUES	28.93	63.87	65.94	67.23	68.28	70.03	74.32	76.66	86.13	167.54
TOTAL COST	G2	G1	A	C	E	D	B	G4S	THRIE	G3
VALUES	432.41	446.02	486.76	542.80	644.42	654.61	660.71	682.34	704.80	1395.14
BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1	G3
VALUES	.46	.35	.30	.26	.25	.25	.23	.21	.17	.11

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 7-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 13 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 215.70

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	A	D	THRIE	C	G3	B	G4W	G1
VALUES	28.54	61.97	64.61	65.11	66.03	66.71	70.56	73.18	82.81	83.00	163.63
TOTAL COST	G2	G1	A	C	E	B	D	G4S	D	THRIE	G3
VALUES	432.02	442.10	483.59	534.03	643.09	651.24	659.51	680.44	701.48	785.18	1391.65
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1	G3
VALUES	.46	.36	.31	.26	.25	.25	.23	.21	.21	.19	.11

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	THRIE	E	D	C	G3	B	G4W	G1
VALUES	28.16	59.83	61.57	63.00	63.23	64.66	66.48	68.29	74.22	74.40	159.06
TOTAL COST	G2	G1	A	C	E	B	D	G4S	D	THRIE	G3
VALUES	431.63	437.53	480.05	534.95	641.71	647.69	658.14	678.30	697.88	781.48	1387.76
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1	G3
VALUES	.46	.37	.32	.26	.25	.25	.24	.22	.21	.20	.11

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	THRIE	E	C	D	G3	B	G4W	G1
VALUES	27.75	57.49	57.85	59.10	61.75	62.27	63.11	65.20	75.49	75.67	153.82
TOTAL COST	G2	G1	A	C	E	B	D	G4S	D	THRIE	G3
VALUES	431.23	432.29	476.33	530.74	640.23	643.97	656.59	675.97	694.15	777.58	1383.68
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	G1	THRIE	G3
VALUES	.47	.38	.33	.27	.26	.26	.25	.23	.22	.22	.11

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	G4S	THRIE	C	E	G3	D	B	G4W	G1
VALUES	27.33	54.33	55.08	55.39	58.29	60.12	61.30	61.38	71.93	72.11	147.97
TOTAL COST	G1	G2	A	C	E	B	D	G4S	D	THRIE	G3
VALUES	426.44	430.81	472.81	526.76	638.60	640.40	654.85	673.56	690.58	773.86	1379.77
BENEFIT/COST	G2	A	C	E	D	G4S	B	G1	G4W	THRIE	G3
VALUES	.47	.39	.34	.27	.26	.26	.25	.24	.23	.22	.12

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	THRIE	G4S	C	G3	E	D	B	G4W	G1
VALUES	26.88	51.43	52.29	52.72	54.96	58.03	58.29	59.47	68.86	69.04	141.57
TOTAL COST	G1	G2	A	C	E	B	D	G4S	D	THRIE	G3
VALUES	420.05	430.36	469.91	523.43	636.77	637.34	652.94	671.19	687.51	770.76	1376.51
BENEFIT/COST	G2	A	C	E	G1	G4S	D	B	G4W	THRIE	G3
VALUES	.47	.39	.34	.27	.27	.26	.26	.26	.24	.23	.12

D-7-8

SUMMARY OF RESULTS ALL DIVIDED HIGHWAYS W/ 7-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 15 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 187.23
 ADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	G1	A	THRIE	C	G3	B	G4W
VALUES	30.68	69.33	70.75	71.38	73.90	77.18	79.18	86.24	85.44	96.70	96.90
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	352.37	434.16	495.66	554.72	649.86	664.23	665.18	687.80	715.38	797.65	1404.52
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.41	.39	.26	.22	.20	.20	.19	.16	.15	.15	.08
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	G1	D	A	THRIE	C	G3	B	G4W
VALUES	30.18	68.22	69.95	70.00	70.01	75.41	77.42	83.65	84.51	94.39	94.58
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	348.48	433.65	493.88	552.12	648.43	662.86	663.49	686.69	713.06	795.90	1402.99
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.42	.39	.27	.22	.20	.20	.19	.16	.15	.15	.08
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	E	D	A	THRIE	C	G3	B	G4W
VALUES	29.73	65.84	66.96	68.59	69.20	73.38	75.35	80.83	82.29	91.88	92.08
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	344.32	433.21	491.86	549.31	647.06	660.36	662.67	685.44	710.55	793.83	1400.76
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.44	.39	.27	.23	.21	.20	.19	.17	.16	.15	.08
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	E	D	A	THRIE	C	G3	B	G4W
VALUES	29.32	61.33	65.52	67.26	68.28	71.03	72.90	77.74	79.69	89.15	89.34
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	339.81	432.80	489.51	546.22	645.73	657.62	661.75	684.00	707.82	791.38	1398.17
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.45	.39	.28	.23	.21	.20	.20	.17	.16	.16	.08
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	E	D	A	THRIE	C	G3	B	G4W
VALUES	28.93	56.40	63.87	65.94	67.23	68.28	70.03	74.32	76.66	86.13	86.32
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	334.88	432.41	486.76	542.80	644.42	654.61	660.70	682.34	704.80	788.50	1395.14
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.47	.39	.28	.24	.21	.20	.20	.18	.16	.16	.08

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 7-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 15 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 187.23
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
SOCIETAL COST VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
TOTAL COST VALUES	28.54	51.04	61.97	64.61	65.11	66.03	66.71	70.56	73.18	82.81	83.00
BENEFIT/COST VALUES	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
1 STATE COST VALUES	329.52	432.02	483.59	539.03	643.09	651.29	659.51	680.44	701.48	785.18	1391.65
SOCIETAL COST VALUES	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
TOTAL COST VALUES	.49	.39	.29	.25	.21	.20	.20	.18	.17	.17	.04
-2 STATE COST VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
SOCIETAL COST VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
TOTAL COST VALUES	28.16	45.37	59.83	61.57	63.00	63.23	64.66	66.48	69.29	79.22	79.40
BENEFIT/COST VALUES	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
3 STATE COST VALUES	323.85	431.63	480.05	534.95	641.71	647.69	658.14	678.30	697.88	781.48	1387.76
SOCIETAL COST VALUES	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
TOTAL COST VALUES	.51	.39	.30	.26	.21	.21	.21	.19	.17	.17	.09
-4 STATE COST VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
SOCIETAL COST VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
TOTAL COST VALUES	27.75	39.80	57.49	57.85	59.10	61.75	62.27	63.11	65.20	75.49	75.67
BENEFIT/COST VALUES	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
5 STATE COST VALUES	318.28	431.23	476.33	530.74	640.23	643.97	656.59	675.97	694.15	777.58	1383.68
SOCIETAL COST VALUES	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
TOTAL COST VALUES	.53	.40	.31	.27	.22	.21	.21	.20	.18	.18	.09
-6 STATE COST VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
SOCIETAL COST VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
TOTAL COST VALUES	27.33	35.06	54.33	55.08	55.39	58.29	60.12	61.30	61.38	71.93	72.11
BENEFIT/COST VALUES	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
7 STATE COST VALUES	313.54	430.81	472.81	526.76	638.60	640.40	654.85	673.56	690.58	773.86	1379.77
SOCIETAL COST VALUES	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
TOTAL COST VALUES	.55	.40	.32	.28	.22	.21	.21	.20	.19	.18	.10
-8 STATE COST VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
SOCIETAL COST VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
TOTAL COST VALUES	26.88	32.02	51.43	52.29	52.72	54.96	58.03	58.29	59.47	68.86	69.04
BENEFIT/COST VALUES	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
9 STATE COST VALUES	310.50	430.36	469.91	523.43	636.77	637.34	652.94	671.19	687.51	770.76	1376.51
SOCIETAL COST VALUES	G1	G2	A	C	E	G4S	D	B	G4W	THRIE	G3
TOTAL COST VALUES	.56	.40	.32	.28	.22	.22	.22	.21	.19	.19	.10

A.291

D-7-8

D-7-10

SUMMARY OF RESULTS ALL DIVIDED HIGHWAYS W/ 7-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 17 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 163.15
 ADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	583.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G4S	D	E	A	THRIE	C	B	G4W	G4W	B	G4W
VALUES	30.58	38.55	69.33	70.75	71.38	72.18	79.18	86.24	86.44	86.44	96.70	96.90
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3	G3
VALUES	317.02	434.06	495.66	559.72	644.86	664.23	665.18	687.80	715.38	797.65	1404.92	G3
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3	G3
VALUES	.45	.33	.21	.16	.16	.16	.15	.12	.12	.11	.06	.06
8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	583.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	E	D	A	THRIE	C	B	G4W	B	G4W
VALUES	30.14	36.89	68.22	69.95	70.01	75.41	77.42	83.65	84.51	84.51	94.39	94.58
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3	G3
VALUES	315.36	433.61	493.88	552.12	648.43	662.86	663.49	686.69	713.06	795.90	1402.99	G3
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3	G3
VALUES	.45	.33	.21	.17	.16	.16	.15	.12	.12	.11	.06	.06
6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	583.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	E	D	A	THRIE	C	B	G4W	B	G4W
VALUES	29.72	35.48	66.96	68.59	69.20	73.38	75.35	80.83	82.29	82.29	91.88	92.08
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3	G3
VALUES	313.46	433.19	491.86	549.31	647.06	660.36	662.67	685.44	710.55	793.83	1400.76	G3
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3	G3
VALUES	.46	.33	.21	.18	.16	.16	.16	.13	.12	.11	.06	.06
4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	583.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	E	D	A	THRIE	C	B	G4W	B	G4W
VALUES	29.32	34.32	65.52	67.26	68.28	71.03	72.90	77.74	79.69	79.69	89.15	89.34
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3	G3
VALUES	312.80	432.79	489.51	546.22	645.73	657.62	661.75	684.00	707.82	791.38	1398.17	G3
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3	G3
VALUES	.46	.33	.22	.18	.17	.16	.16	.13	.13	.12	.06	.06
2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	583.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	E	D	A	THRIE	C	B	G4W	B	G4W
VALUES	28.93	33.39	63.87	65.94	67.23	68.28	70.03	74.32	76.66	76.66	86.13	86.32
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3	G3
VALUES	311.87	432.40	486.76	542.80	644.42	654.61	660.70	682.34	704.80	788.50	1395.14	G3
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3	G3
VALUES	.47	.33	.23	.19	.17	.16	.16	.14	.13	.12	.07	.07

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 7-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 17 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 163.15
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0	STATE COST VALUES SOCIETAL COST VALUES TOTAL COST VALUES BENEFIT/COST VALUES	G1 278.48 G2 403.48 G1 32.67 G2 432.02 G1 311.14 G2 47.33	A 418.48 G4S 61.97 A 483.59 A 47.23	C 468.48 E 64.61 C 539.03 C 52.20	B 568.48 A 65.11 E 643.09 E 17.17	E 578.48 D 66.03 B 651.29 D 16.16	D 593.48 THRIE 66.71 D 659.51 G4S 16.16	D 618.48 C 70.56 G4S 680.44 B 14.14	G4S 618.48 G3 73.18 G4W 701.48 THRIE 13.13	THRIE 718.48 B 82.81 THRIE 785.18 G4W 13.13	G3 1318.48 G4W 83.00 G3 1341.65 G3 13.07
-2	STATE COST VALUES SOCIETAL COST VALUES TOTAL COST VALUES BENEFIT/COST VALUES	G1 278.48 G2 403.48 G1 32.12 G2 431.63 G1 310.60 G2 47.33	A 418.48 G4S 59.83 A 480.05 A 47.24	C 468.48 A 61.57 C 534.95 C 21.21	B 568.48 THRIE 63.00 E 641.71 E 17.17	E 578.48 D 63.23 B 647.69 G4S 17.17	D 593.48 D 64.66 D 658.14 D 17.17	D 618.48 C 66.48 G4S 678.30 B 15.15	G4S 618.48 G3 69.29 G4W 697.88 THRIE 14.14	THRIE 718.48 B 79.22 THRIE 781.48 G4W 14.14	G3 1318.48 G4W 79.40 G3 1382.76 G3 14.07
-4	STATE COST VALUES SOCIETAL COST VALUES TOTAL COST VALUES BENEFIT/COST VALUES	G1 278.48 G2 403.48 G1 31.70 G2 431.23 G1 310.18 G2 47.34	A 418.48 G4S 57.49 A 476.33 A 47.25	C 468.48 A 57.85 C 530.74 C 22.22	B 568.48 THRIE 59.10 E 640.23 E 18.18	E 578.48 C 61.75 B 643.97 G4S 17.17	D 593.48 C 62.27 D 656.59 D 17.17	D 618.48 D 63.11 B 675.97 B 15.15	G4S 618.48 G3 65.20 G4W 694.15 THRIE 14.14	THRIE 718.48 B 75.49 THRIE 772.58 G4W 14.14	G3 1318.48 G4W 75.67 G3 1383.68 G3 14.07
-6	STATE COST VALUES SOCIETAL COST VALUES TOTAL COST VALUES BENEFIT/COST VALUES	G1 278.48 G2 403.48 G1 31.37 G2 430.81 G1 309.84 G2 47.34	A 418.48 G4S 54.33 A 472.81 A 47.26	C 468.48 G4S 55.08 C 526.76 C 22.22	B 568.48 THRIE 55.39 E 638.60 E 18.18	E 578.48 C 58.29 B 640.40 G4S 17.17	D 593.48 E 60.12 D 654.95 D 17.17	D 618.48 G3 61.30 B 673.56 B 16.16	G4S 618.48 U 61.38 G4W 690.58 THRIE 15.15	THRIE 718.48 B 71.93 THRIE 773.85 G4W 15.15	G3 1318.48 G4W 72.11 G3 1379.77 G3 15.08
-8	STATE COST VALUES SOCIETAL COST VALUES TOTAL COST VALUES BENEFIT/COST VALUES	G1 278.48 G2 403.48 G1 26.88 G2 309.53 G1 309.53 G2 47.34	A 418.48 G4S 51.43 A 469.91 A 47.27	C 468.48 THRIE 52.29 C 523.43 C 23.23	B 568.48 G4S 52.72 E 636.77 E 18.18	E 578.48 C 54.96 B 637.34 G4S 18.18	D 593.48 G3 58.03 D 652.94 D 17.17	D 618.48 E 58.29 G4S 671.19 B 17.17	G4S 618.48 D 59.47 G4W 687.51 THRIE 15.15	THRIE 718.48 B 66.85 THRIE 770.76 G4W 15.15	G3 1318.48 G4W 69.04 G3 1375.51 G3 15.08

D-7-12

SUMMARY OF RESULTS ALL DIVIDED HIGHWAYS W/ 7-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 19 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 142.84
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA											
	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST VALUES SOCIEITAL COST VALUES TOTAL COST VALUES BENEFIT/COST VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	G2	G1	G4S	D	E	A	THRIE	C	G3	B	G4W
	30.58	32.37	69.33	70.75	71.38	72.18	79.18	86.24	86.35	96.70	96.90
	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
	310.84	434.06	445.66	554.22	649.86	664.23	665.18	687.80	715.38	797.65	1404.82
	G1	G2	A	E	D	C	G4S	THRIE	B	G4W	G3
.40	.28	.16	.12	.12	.12	.12	.09	.08	.07	.04	
8 STATE COST VALUES SOCIEITAL COST VALUES TOTAL COST VALUES BENEFIT/COST VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	G2	G1	G4S	E	D	A	THRIE	C	G3	B	G4W
	30.14	32.21	68.22	69.95	70.01	75.41	77.42	83.65	84.47	94.39	94.58
	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	310.68	433.61	443.88	552.12	648.43	662.86	663.44	686.69	713.06	795.90	1402.95
	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
.40	.28	.16	.13	.13	.12	.12	.09	.09	.08	.04	
6 STATE COST VALUES SOCIEITAL COST VALUES TOTAL COST VALUES BENEFIT/COST VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	G2	G1	G4S	E	D	A	THRIE	C	G3	B	G4W
	29.72	32.08	66.96	68.59	69.20	73.38	75.35	80.83	82.27	91.88	92.09
	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	310.55	433.19	441.86	549.31	647.06	660.36	662.67	685.44	710.55	793.83	1400.75
	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
.40	.28	.17	.13	.13	.12	.12	.09	.09	.08	.05	
4 STATE COST VALUES SOCIEITAL COST VALUES TOTAL COST VALUES BENEFIT/COST VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	G2	G1	G4S	E	D	A	THRIE	C	G3	B	G4W
	29.32	31.96	65.52	67.26	68.28	71.03	72.90	77.74	79.69	89.15	89.34
	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	310.44	432.79	449.51	546.22	645.73	657.62	661.75	684.00	707.82	791.38	1398.16
	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
.40	.28	.17	.14	.13	.13	.13	.10	.09	.09	.05	
2 STATE COST VALUES SOCIEITAL COST VALUES TOTAL COST VALUES BENEFIT/COST VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	G2	G1	G4S	E	D	A	THRIE	C	G3	B	G4W
	28.93	31.85	63.87	65.94	67.23	68.28	70.03	74.32	76.66	86.13	86.32
	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	310.33	432.40	448.76	542.80	644.42	654.61	660.70	682.34	704.80	782.50	1395.14
	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
.40	.28	.18	.15	.13	.13	.13	.10	.10	.09	.05	

A.294

A.294

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 7-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 19 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 142.84

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1	2	3	4	5	6	7	8	9	10	11
0										
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
VALUES										
G2	G1	G4S	E	A	D	THRIE	C	G3	B	G4W
28.54	31.74	61.97	64.61	65.11	66.03	66.71	70.56	73.18	82.81	83.00
VALUES										
G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
310.21	432.02	483.59	539.03	643.09	651.29	659.51	680.44	701.48	785.18	1391.65
VALUES										
G1	G2	A	C	E	G4S	D	THRIE	B	G4W	G3
40	28	19	15	14	13	13	11	11	10	05
VALUES										
-2										
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
VALUES										
G2	G1	G4S	A	THRIE	E	D	C	G3	B	G4W
28.16	31.61	59.83	61.57	63.00	63.23	64.66	66.48	69.29	79.22	79.40
VALUES										
G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
310.08	431.63	480.05	534.95	641.71	647.69	658.14	678.30	697.88	781.48	1382.76
VALUES										
G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
40	28	19	16	14	13	13	11	11	10	06
VALUES										
-4										
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
VALUES										
G2	G1	G4S	A	THRIE	E	C	D	G3	B	G4W
27.75	31.45	57.49	57.85	59.10	61.75	62.27	63.11	65.20	75.49	75.67
VALUES										
G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
309.93	431.23	476.33	530.74	640.23	643.97	656.59	675.97	694.15	777.58	1383.68
VALUES										
G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
40	29	20	17	14	13	12	12	12	11	06
VALUES										
-6										
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
VALUES										
G2	G1	A	G4S	THRIE	C	E	G3	D	B	G4W
27.33	31.26	54.33	55.08	55.39	58.29	60.12	61.30	61.38	71.93	72.11
VALUES										
G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
309.73	430.81	472.81	526.76	638.60	640.40	654.85	673.56	690.58	773.86	1379.77
VALUES										
G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
40	29	21	18	14	14	14	12	12	11	06
VALUES										
-8										
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
VALUES										
G2	G1	A	THRIE	G4S	C	G3	E	D	B	G4W
26.88	31.01	51.43	52.29	52.72	54.96	58.03	58.29	59.47	68.86	69.04
VALUES										
G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
309.49	430.36	469.91	523.43	636.77	637.34	652.94	671.19	687.51	770.76	1376.51
VALUES										
G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
40	29	22	19	15	15	14	13	13	12	06
VALUES										

A.295

D-7-12

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ EMBANKMENT HINGE AT 8 FT

D-8-0

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 8 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 113.08

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	E	G2	A	THRIE	G3	C	B	G4W	G1
VALUES	67.10	67.98	70.50	72.32	74.41	76.51	83.63	85.48	94.81	95.00	175.86
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	454.34	475.80	492.88	553.95	648.98	661.46	663.28	685.58	713.47	794.98	1902.11
BENEFIT/COST	G2	A	D	G4S	E	C	THRIE	B	G4W	G3	G1
VALUES	.10	.09	.08	.07	.07	.06	.05	.03	.03	.02	-.23

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	G2	E	A	THRIE	G3	C	B	G4W	G1
VALUES	64.05	67.24	68.38	68.80	72.93	75.14	82.02	82.91	92.50	92.69	173.37
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	451.85	471.85	491.40	551.38	647.28	660.72	660.88	684.53	711.16	793.62	1900.44
BENEFIT/COST	G2	A	D	E	G4S	C	THRIE	B	G4W	G3	G1
VALUES	.11	.10	.08	.08	.08	.06	.05	.04	.03	.02	-.22

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	A	THRIE	G3	C	B	G4W	G1
VALUES	64.21	64.96	66.51	67.24	71.24	73.50	80.18	80.21	90.09	90.28	170.66
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	449.14	467.68	489.72	548.69	645.72	658.56	659.94	683.43	708.75	791.97	1398.66
BENEFIT/COST	G2	A	F	D	G4S	C	THRIE	B	G4W	G3	G1
VALUES	.12	.10	.08	.08	.08	.07	.06	.04	.04	.02	-.21

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	A	THRIE	C	G3	B	G4W	G1
VALUES	59.73	63.76	65.75	65.74	69.28	71.52	77.32	78.04	87.52	87.70	167.68
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	446.16	463.20	487.75	545.79	644.26	655.94	659.23	682.23	706.18	789.99	1396.51
BENEFIT/COST	G2	A	E	G4S	D	C	THRIE	B	G4W	G3	G1
VALUES	.13	.10	.08	.08	.08	.08	.06	.04	.04	.03	-.20

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	G3	B	G4W	G1
VALUES	54.84	62.39	64.41	64.91	66.94	69.13	74.15	75.49	84.72	84.90	164.36
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	442.83	458.32	485.41	542.63	642.88	653.19	658.39	680.86	703.37	787.60	1393.97
BENEFIT/COST	G2	A	E	C	G4S	D	THRIE	B	G4W	G3	G1
VALUES	.14	.11	.08	.08	.08	.08	.06	.05	.05	.03	-.18

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ EMBANKMENT HINGE AT 8 FT

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 8 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 113.08
 ADOT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	F	D	A	THRIE	C	B	G4W	G1
VALUES	49.48	60.80	63.07	63.95	64.16	66.27	70.64	81.63	81.81	160.60
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	434.07	462.95	482.64	532.12	641.54	650.10	657.43	700.28	784.75	1390.96
BENEFIT/COST	G2	A	C	E	G4S	D	THRIE	B	G3	G1
VALUES	.16	.12	.09	.04	.08	.08	.07	.06	.05	-.17

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	E	D	THRIE	C	B	G4W	G1
VALUES	49.63	58.45	60.93	61.74	62.84	62.44	66.77	78.22	78.40	155.32
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	434.80	467.11	479.40	535.24	640.22	646.70	656.31	677.43	781.41	1387.45
BENEFIT/COST	G2	A	C	E	G4S	D	THRIE	B	G3	G1
VALUES	.17	.12	.10	.09	.09	.08	.07	.06	.06	-.16

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	THRIE	E	D	C	B	G4W	G1
VALUES	37.54	54.87	57.33	59.22	60.39	61.56	62.61	65.08	74.75	151.49
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	424.96	461.01	475.80	531.04	638.86	643.05	655.03	675.34	772.70	1383.55
BENEFIT/COST	G2	A	C	E	G4S	D	THRIE	B	G3	G1
VALUES	.19	.13	.11	.09	.09	.09	.07	.07	.04	-.14

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	G4S	THRIE	C	E	D	B	G4W	G1
VALUES	31.81	53.68	54.63	55.44	58.48	58.46	60.10	61.10	71.09	146.11
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	424.59	435.28	472.16	526.46	637.43	639.40	653.57	673.11	773.41	1374.58
BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G3	G1
VALUES	.20	.14	.12	.09	.09	.09	.08	.07	.04	-.12

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	THRIE	G4S	C	E	G3	D	G4W	G1
VALUES	27.51	50.51	52.12	52.42	54.88	57.39	57.61	58.47	67.68	140.30
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	418.77	430.98	468.99	523.36	635.86	636.16	651.95	670.89	770.59	1376.04
BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G3	G1
VALUES	.21	.15	.12	.10	.10	.09	.08	.08	.07	-.10

A.297

D-8-0

D-8-2

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 8-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 10 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 268.14
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	D	G3	C	A	G4S	E	G4W	G2	G1
VALUES	84.73	114.45	119.17	120.55	161.84	165.78	166.59	185.86	198.24	280.22
TOTAL COST	G1	A	C	G2	D	E	B	THRIE	G4W	G3
VALUES	558.70	580.31	589.03	601.72	707.93	745.07	754.34	803.21	804.53	1437.65
BENEFIT/COST	C	D	THRIE	A	E	G2	G4S	B	G3	G1
VALUES	.32	.26	.26	.25	.18	.17	.17	.14	.11	-.04

8 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	D	G3	C	A	G4S	E	B	G2	G1
VALUES	81.63	110.15	114.71	115.16	158.74	161.88	163.00	181.86	193.56	280.24
TOTAL COST	G1	A	C	G2	D	E	B	THRIE	G4W	G3
VALUES	558.72	577.21	583.63	597.03	703.62	741.48	750.15	800.11	800.33	1433.14
BENEFIT/COST	C	D	A	THRIE	G2	E	G4S	B	G3	G1
VALUES	.33	.27	.26	.26	.18	.18	.17	.15	.12	-.04

6 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	D	C	G3	A	G4S	E	B	G2	G1
VALUES	78.46	105.51	109.38	109.76	155.00	157.45	158.96	176.82	188.15	280.27
TOTAL COST	G1	A	C	G2	D	E	B	THRIE	G4W	G3
VALUES	558.74	573.48	577.86	591.62	698.99	737.43	745.30	795.49	796.93	1428.24
BENEFIT/COST	C	D	A	THRIE	G2	E	G4S	B	G3	G1
VALUES	.34	.27	.27	.26	.20	.19	.18	.16	.12	-.04

4 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	D	C	G3	A	G4S	E	B	G2	G1
VALUES	75.16	100.44	103.11	104.21	150.47	152.35	154.34	171.17	181.85	280.30
TOTAL COST	G1	A	C	G2	D	E	B	THRIE	G4W	G3
VALUES	558.78	568.95	571.59	585.33	693.92	732.82	739.65	789.84	793.64	1422.69
BENEFIT/COST	C	D	A	THRIE	G2	E	G4S	B	G3	G1
VALUES	.35	.28	.28	.27	.21	.20	.19	.17	.12	-.04

2 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	D	C	G3	A	G4S	E	B	G2	G1
VALUES	71.68	94.84	96.24	97.92	144.99	146.42	149.02	164.55	174.74	280.34
TOTAL COST	G1	A	C	G2	D	E	B	THRIE	G4W	G3
VALUES	558.82	563.46	564.72	577.95	686.31	727.49	733.03	783.21	790.16	1416.39
BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G3	G1
VALUES	.37	.29	.29	.27	.23	.21	.20	.18	.13	-.04

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 8-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 10 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 268.14

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0	STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4W 618.48	G4S 618.48	THRIE 1318.48
	SOCIETAL COST	THRIE 67.95	D 88.60	C 88.65	G3 90.77	A 138.38	G4S 139.52	E 142.85	B 156.80	G4W 156.84	G1 280.39
	TOTAL COST	A 556.86	C 557.13	G1 558.86	G2 569.32	D 682.07	E 721.32	B 725.28	G4S 758.00	G4W 775.46	THRIE 1409.25
	BENEFIT/COST VALUES	C .38	A .31	D .30	THRIE .28	G2 .25	E .22	G4S .21	B .20	G4W .18	G3 -.04
-2	STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4W 618.48	G4S 618.48	THRIE 1318.48
	SOCIETAL COST	THRIE 63.96	C 80.35	D 81.72	G3 82.77	A 130.59	G4S 131.57	E 135.75	B 147.85	G4W 148.03	G1 280.44
	TOTAL COST	C 548.82	A 549.06	G1 558.92	G2 559.36	D 675.19	E 714.22	B 716.32	G4S 750.05	G4W 766.50	THRIE 1401.24
	BENEFIT/COST VALUES	C .40	A .33	D .31	THRIE .28	G2 .28	E .23	G4S .22	B .21	G4W .19	G1 -.04
-4	STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4W 618.48	G4S 618.48	THRIE 1318.48
	SOCIETAL COST	THRIE 59.79	C 71.59	G3 74.19	D 74.42	A 121.75	G4S 122.70	E 127.80	B 137.88	G4W 138.06	G1 280.50
	TOTAL COST	C 540.06	A 540.23	G2 548.27	G1 558.98	D 667.89	E 706.28	B 706.36	G4S 741.17	G4W 756.53	THRIE 1392.67
	BENEFIT/COST VALUES	C .42	A .35	D .33	G2 .31	THRIE .29	E .24	G4S .24	B .23	G4W .21	G1 -.04
-6	STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4W 618.48	G4S 618.48	THRIE 1318.48
	SOCIETAL COST	THRIE 55.71	C 63.17	G3 65.87	D 67.33	A 112.44	G4S 113.40	E 119.38	B 127.55	G4W 127.73	G1 280.57
	TOTAL COST	A 530.91	C 531.65	G2 536.74	G1 559.04	D 660.81	E 696.03	B 697.86	G4S 731.88	G4W 746.20	THRIE 1384.34
	BENEFIT/COST VALUES	C .44	A .37	D .34	G2 .33	THRIE .30	E .26	G4S .25	B .25	G4W .23	G1 -.04
-8	STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 468.48	B 568.48	E 578.48	D 593.48	G4W 618.48	G4S 618.48	THRIE 1318.48
	SOCIETAL COST	THRIE 52.23	C 56.45	G3 59.20	D 61.55	A 103.66	G4S 104.58	E 111.20	B 118.02	G4W 118.19	G1 280.63
	TOTAL COST	A 522.13	C 524.93	G2 525.99	G1 559.10	D 655.03	E 686.50	B 689.67	G4S 723.06	G4W 736.67	THRIE 1377.68
	BENEFIT/COST VALUES	C .45	A .39	G2 .36	D .35	THRIE .30	E .27	G4S .26	B .26	G4W .24	G1 -.04

A.299

D-8-2

D-8-4

SUMMARY OF RESULTS ALL DIVIDED HIGHWAYS W/ 8-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 231.79
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	G2	A	THRIE	E	G3	C	B	G4W	G1
VALUES	67.02	67.91	72.32	74.41	76.75	78.08	83.63	85.48	94.81	95.00	240.15
TOTAL COST	G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	475.80	492.88	518.63	553.95	656.56	661.39	663.29	685.50	713.48	795.23	1902.11
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THRIE	G3	G1
VALUES	.40	.38	.31	.28	.27	.27	.24	.22	.22	.11	-.03
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	G2	A	THRIE	E	G3	C	B	G4W	G1
VALUES	66.01	67.21	68.38	72.93	74.86	75.26	82.02	82.91	92.50	92.69	239.00
TOTAL COST	G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	471.85	491.40	517.48	551.38	653.34	660.68	660.98	684.49	711.17	793.73	1900.49
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G3	G1
VALUES	.41	.38	.32	.28	.27	.27	.25	.22	.22	.11	-.03
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	A	E	THRIE	G3	C	B	G4W	G1
VALUES	64.21	64.94	66.50	71.24	71.92	73.54	80.18	80.21	90.09	90.28	237.76
TOTAL COST	G2	A	G1	C	E	H	D	G4S	G4W	THRIE	G3
VALUES	467.68	489.72	516.23	548.69	650.39	658.57	659.98	683.42	708.75	792.02	1946.66
BENEFIT/COST	G2	A	C	D	E	G4S	H	G4W	THRIE	G3	G1
VALUES	.42	.38	.32	.28	.28	.28	.27	.23	.22	.11	-.02
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	A	THRIE	C	G3	B	G4W	G1
VALUES	59.73	65.75	65.75	69.24	69.28	71.53	77.32	78.04	87.52	87.70	236.41
TOTAL COST	G2	A	G1	C	E	R	D	G4S	G4W	THRIE	G3
VALUES	463.20	487.75	514.88	545.79	647.72	655.99	659.22	682.23	706.18	790.01	1946.51
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
VALUES	.43	.39	.33	.28	.28	.28	.27	.23	.22	.12	-.02
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	A	THRIE	C	G3	B	G4W	G1
VALUES	54.84	62.39	64.91	66.83	66.94	69.13	74.15	75.49	84.72	84.90	234.92
TOTAL COST	G2	A	G1	C	E	R	D	G4S	G4W	THRIE	G3
VALUES	458.32	485.41	513.40	542.63	645.31	653.19	658.39	680.86	703.37	787.61	1943.97
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
VALUES	.44	.39	.34	.24	.24	.28	.27	.24	.23	.12	-.01

A.300

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 8-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 231.79
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

OF CURVE																			
1	2	3	4	5	6	7	8	9	10	11									
0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3							
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48							
	SOCIETAL COST	G2	G4S	D	A	E	THRIE	C	G3	B	G4W	G1							
	VALUES	49.48	60.80	63.95	64.16	64.67	66.27	70.64	72.48	81.63	81.81	233.29							
	TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3							
	VALUES	452.95	482.64	511.77	539.12	643.14	650.10	657.43	679.27	700.23	784.75	1390.46							
	BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1							
	VALUES	.45	.40	.34	.29	.28	.28	.28	.24	.23	.12	-.01							

-2	STATE COST	G1	G2	A	418.48	C	468.48	B	568.48	E	578.48	D	593.48	G4W	618.48	G4S	618.48	THRIE	G3
	VALUES	278.48	403.48	418.48	418.48	468.48	568.48	578.48	578.48	578.48	593.48	593.48	593.48	618.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	A	A	E	E	D	THRIE	C	C	C	C	G3	B	B	B	G4W	G1
	VALUES	43.63	58.95	60.93	62.72	62.84	62.94	62.94	66.77	66.77	66.77	66.77	66.77	68.97	68.97	68.97	68.97	78.22	231.48
	TOTAL COST	G2	A	G1	C	C	E	E	B	D	D	D	D	G4S	G4W	G4W	G4W	THRIE	G3
	VALUES	447.11	479.40	509.96	535.24	535.24	641.19	646.70	656.31	656.31	656.31	656.31	656.31	677.43	696.88	696.88	696.88	781.41	1387.45
	BENEFIT/COST	G2	A	C	E	E	D	D	G4S	B	B	B	B	G4W	THRIE	THRIE	THRIE	G3	G1
	VALUES	.47	.41	.35	.29	.29	.28	.28	.28	.28	.28	.28	.28	.25	.24	.24	.24	.12	.00

A.301

-4	STATE COST	G1	G2	A	418.48	C	468.48	B	568.48	E	578.48	D	593.48	G4W	618.48	G4S	618.48	THRIE	G3
	VALUES	278.48	403.48	418.48	418.48	468.48	568.48	578.48	578.48	578.48	593.48	593.48	593.48	618.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	A	A	THRIE	E	D	D	D	D	D	D	G3	B	B	B	G4W	G1
	VALUES	37.54	56.87	57.33	59.22	60.93	61.56	61.56	62.61	62.61	62.61	62.61	62.61	65.08	65.08	65.08	65.08	74.75	220.45
	TOTAL COST	G2	A	G1	C	C	E	E	B	D	D	D	D	G4S	G4W	G4W	G4W	THRIE	G3
	VALUES	441.01	475.80	507.93	531.09	531.09	639.40	643.05	655.03	655.03	655.03	655.03	655.03	675.34	693.23	693.23	693.23	777.70	1383.55
	BENEFIT/COST	G2	A	C	E	E	D	D	G4S	B	B	B	B	G4W	THRIE	THRIE	THRIE	G3	G1
	VALUES	.48	.42	.36	.30	.30	.29	.28	.28	.28	.28	.28	.28	.25	.24	.24	.24	.13	.01

-6	STATE COST	G1	G2	A	418.48	C	468.48	B	568.48	E	578.48	D	593.48	G4W	618.48	G4S	618.48	THRIE	G3
	VALUES	278.48	403.48	418.48	418.48	468.48	568.48	578.48	578.48	578.48	593.48	593.48	593.48	618.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	A	A	THRIE	C	C	E	E	E	D	D	G3	B	B	B	G4W	G1
	VALUES	31.81	53.68	54.63	55.44	58.48	59.22	59.22	60.10	60.10	60.10	60.10	60.10	61.10	61.10	61.10	61.10	71.09	227.16
	TOTAL COST	G2	A	G1	C	C	E	E	B	D	D	D	D	G4S	G4W	G4W	G4W	THRIE	G3
	VALUES	435.28	472.16	505.63	526.96	526.96	637.69	639.40	653.57	653.57	653.57	653.57	653.57	673.11	689.57	689.57	689.57	773.91	1379.58
	BENEFIT/COST	G2	A	C	E	E	D	D	G4S	B	B	B	B	G4W	THRIE	THRIE	THRIE	G3	G1
	VALUES	.50	.43	.37	.30	.30	.29	.29	.29	.29	.29	.29	.29	.26	.25	.25	.25	.13	.02

-8	STATE COST	G1	G2	A	418.48	C	468.48	B	568.48	E	578.48	D	593.48	G4W	618.48	G4S	618.48	THRIE	G3
	VALUES	278.48	403.48	418.48	418.48	468.48	568.48	578.48	578.48	578.48	593.48	593.48	593.48	618.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	A	THRIE	G4S	C	C	E	E	E	G3	D	D	D	B	B	B	G4W	G1
	VALUES	27.51	50.51	52.12	52.42	54.88	57.50	57.50	57.50	57.50	57.50	57.50	57.50	58.47	58.47	58.47	58.47	67.85	224.53
	TOTAL COST	G2	A	G1	C	C	E	E	B	D	D	D	D	G4S	G4W	G4W	G4W	THRIE	G3
	VALUES	430.98	468.99	503.01	523.36	523.36	635.97	636.16	651.95	651.95	651.95	651.95	651.95	670.89	686.33	686.33	686.33	770.59	1376.09
	BENEFIT/COST	G2	A	C	E	E	D	D	G4S	B	B	B	B	G4W	THRIE	THRIE	THRIE	G3	G1
	VALUES	.51	.43	.38	.30	.30	.29	.29	.29	.29	.29	.29	.29	.27	.25	.25	.25	.13	.03

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D-8-6

SUMMARY OF RESULTS ALL DIVIDED HIGHWAYS W/ 8-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 200.87
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10	STATE COST	G1	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	G4S	THRIE	G3
	VALUES	G1	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	G4S	THRIE	G3
	SOCIETAL COST	G2	29.73	67.10	67.98	70.50	74.62	76.51	83.53	85.24	85.24	B	G4W	G1
	VALUES	G2	29.73	67.10	67.98	70.50	74.62	76.51	83.53	85.24	85.24	B	G4W	G1
	TOTAL COST	G1	433.21	447.02	447.02	447.02	447.02	447.02	447.02	447.02	447.02	G4S	THRIE	G3
	VALUES	G1	433.21	447.02	447.02	447.02	447.02	447.02	447.02	447.02	447.02	G4S	THRIE	G3
	BENEFIT/COST	G2	.42	.30	.25	.23	.22	.22	.14	.17	.17	G4W	G1	G3
	VALUES	G2	.42	.30	.25	.23	.22	.22	.14	.17	.17	G4W	G1	G3

8	STATE COST	G1	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	G4S	THRIE	G3
	VALUES	G1	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	G4S	THRIE	G3
	SOCIETAL COST	G2	29.08	66.05	67.24	68.80	73.03	75.14	82.02	82.80	82.80	B	G4W	G1
	VALUES	G2	29.08	66.05	67.24	68.80	73.03	75.14	82.02	82.80	82.80	B	G4W	G1
	TOTAL COST	G1	432.56	445.52	445.52	445.52	445.52	445.52	445.52	445.52	445.52	G4S	THRIE	G3
	VALUES	G1	432.56	445.52	445.52	445.52	445.52	445.52	445.52	445.52	445.52	G4S	THRIE	G3
	BENEFIT/COST	G2	.43	.31	.25	.23	.23	.22	.19	.18	.17	G4W	G1	G3
	VALUES	G2	.43	.31	.25	.23	.23	.22	.19	.18	.17	G4W	G1	G3

6	STATE COST	G1	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	G4S	THRIE	G3
	VALUES	G1	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	G4S	THRIE	G3
	SOCIETAL COST	G2	28.52	64.96	66.51	67.24	71.28	73.50	80.17	80.18	80.18	B	G4W	G1
	VALUES	G2	28.52	64.96	66.51	67.24	71.28	73.50	80.17	80.18	80.18	B	G4W	G1
	TOTAL COST	G1	432.00	443.74	443.74	443.74	443.74	443.74	443.74	443.74	443.74	G4S	THRIE	G3
	VALUES	G1	432.00	443.74	443.74	443.74	443.74	443.74	443.74	443.74	443.74	G4S	THRIE	G3
	BENEFIT/COST	G2	.43	.31	.26	.23	.23	.22	.19	.18	.18	G4W	G1	G3
	VALUES	G2	.43	.31	.26	.23	.23	.22	.19	.18	.18	G4W	G1	G3

4	STATE COST	G1	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	G4S	THRIE	G3
	VALUES	G1	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	G4S	THRIE	G3
	SOCIETAL COST	G2	28.03	63.76	65.75	66.79	69.29	71.52	77.30	78.04	78.04	B	G4W	G1
	VALUES	G2	28.03	63.76	65.75	66.79	69.29	71.52	77.30	78.04	78.04	B	G4W	G1
	TOTAL COST	G1	431.51	441.60	441.60	441.60	441.60	441.60	441.60	441.60	441.60	G4S	THRIE	G3
	VALUES	G1	431.51	441.60	441.60	441.60	441.60	441.60	441.60	441.60	441.60	G4S	THRIE	G3
	BENEFIT/COST	G2	.43	.31	.26	.23	.23	.22	.20	.18	.18	G4W	G1	G3
	VALUES	G2	.43	.31	.26	.23	.23	.22	.20	.18	.18	G4W	G1	G3

2	STATE COST	G1	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	G4S	THRIE	G3
	VALUES	G1	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	G4S	THRIE	G3
	SOCIETAL COST	G2	27.59	62.39	64.41	64.91	66.94	69.13	74.15	75.49	75.49	B	G4W	G1
	VALUES	G2	27.59	62.39	64.41	64.91	66.94	69.13	74.15	75.49	75.49	B	G4W	G1
	TOTAL COST	G1	431.06	439.02	439.02	439.02	439.02	439.02	439.02	439.02	439.02	G4S	THRIE	G3
	VALUES	G1	431.06	439.02	439.02	439.02	439.02	439.02	439.02	439.02	439.02	G4S	THRIE	G3
	BENEFIT/COST	G2	.43	.32	.27	.24	.23	.22	.20	.19	.19	G4W	G1	G3
	VALUES	G2	.43	.32	.27	.24	.23	.22	.20	.19	.19	G4W	G1	G3

A.302

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 8-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 200.87
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	H	G4W	G1
VALUES	27.17	60.80	63.07	63.95	64.16	66.27	70.64	72.48	81.81	157.44
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	430.64	435.91	482.64	539.12	641.54	650.10	657.43	679.27	784.75	1390.96
BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1	G3
VALUES	.43	.33	.28	.24	.23	.23	.21	.19	.16	.10

-2 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	E	D	THRIE	C	H	G4W	G1
VALUES	26.77	58.95	60.93	61.74	62.84	62.94	66.77	78.22	78.40	153.73
TOTAL COST	G2	G1	A	C	E	B	D	G4S	THRIE	G3
VALUES	430.24	435.20	479.40	535.24	600.22	646.70	656.31	677.43	781.41	1387.45
BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1	G3
VALUES	.43	.33	.29	.24	.23	.23	.22	.19	.17	.10

A.303

-4 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	THRIE	E	D	C	B	G4W	G1
VALUES	26.37	58.87	57.33	59.22	60.39	61.56	62.61	65.08	74.25	149.36
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	427.84	429.84	475.80	531.09	638.86	643.05	655.03	675.34	777.70	1383.55
BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1	G3
VALUES	.43	.34	.30	.24	.23	.23	.22	.20	.18	.10

-5 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	G4S	THRIE	C	E	D	G3	G4W	G1
VALUES	25.97	53.68	54.63	55.44	58.48	58.96	60.10	61.10	71.09	144.38
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	422.85	429.44	472.16	526.96	637.43	649.40	653.57	673.11	773.91	1379.58
BENEFIT/COST	G2	A	C	E	D	G4S	B	G1	THRIE	G3
VALUES	.43	.35	.30	.25	.24	.24	.23	.21	.20	.11

-8 STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	THRIE	G4S	C	E	G3	D	G4W	G1
VALUES	25.56	50.51	52.12	52.42	54.88	57.39	57.41	58.47	67.85	136.88
TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
VALUES	417.36	429.03	468.99	523.36	635.86	636.16	651.95	670.89	770.59	1376.09
BENEFIT/COST	G2	A	C	E	G4S	D	B	G1	THRIE	G3
VALUES	.43	.36	.31	.25	.24	.24	.23	.22	.21	.11

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D-8-8

SUMMARY OF RESULTS ALL DIVIDED HIGHWAYS W/ 8-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 174,68
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	A	G1	THRIE	G3	C	B	G4W
VALUES	29.73	66.88	67.75	70.29	74.62	75.44	76.51	83.63	85.24	94.58	94.77
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	353.91	433.21	493.10	553.72	648.77	661.22	663.06	685.35	713.25	794.98	1402.10
BENEFIT/COST	G2	G1	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.36	.36	.24	.19	.18	.18	.17	.14	.14	.13	.07
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	A	G1	THRIE	G3	C	B	G4W
VALUES	29.08	65.94	67.13	68.70	71.54	73.03	75.14	82.01	82.80	92.39	92.58
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	350.01	432.56	491.51	551.27	647.18	660.61	660.87	684.42	711.06	793.62	1400.49
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.37	.36	.24	.20	.18	.18	.18	.14	.14	.13	.07
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	A	G1	THRIE	C	G3	B	G4W
VALUES	28.52	64.92	66.47	67.20	67.41	71.28	73.50	80.17	80.18	90.05	90.23
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	345.89	432.00	489.76	548.64	645.68	658.52	659.95	683.39	708.21	791.97	1398.66
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.39	.36	.25	.20	.19	.18	.18	.15	.14	.14	.07
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	A	THRIE	C	G3	B	G4W
VALUES	29.03	62.99	63.74	65.74	65.77	69.29	71.52	77.30	78.04	87.50	87.69
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	341.47	431.51	487.76	545.78	644.25	655.98	659.21	682.22	706.16	789.99	1396.51
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.40	.36	.25	.21	.19	.18	.18	.15	.14	.14	.07
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	A	THRIE	C	G3	B	G4W
VALUES	27.54	58.18	62.39	64.40	64.91	66.94	69.13	74.15	75.49	84.71	84.90
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	336.66	431.06	485.42	542.62	632.88	653.19	658.38	680.86	703.37	787.60	1393.47
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.42	.36	.26	.21	.19	.18	.18	.16	.15	.15	.08

A.304

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 8-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 174.68

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

	1	2	3	4	5	6	7	8	9	10	11
0											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	E	D	A	THRIE	C	G3	B	G4W
VALUES	27.17	52.90	60.80	63.07	63.95	64.16	66.27	70.64	72.48	81.63	81.81
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	331.37	430.64	482.64	539.12	641.54	650.10	657.43	678.27	700.28	784.75	1390.96
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.44	.37	.26	.22	.19	.19	.18	.16	.15	.15	.08
-2											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	A	E	D	THRIE	C	G3	B	G4W
VALUES	26.77	42.16	58.95	60.93	61.74	62.84	62.94	66.77	68.97	78.22	78.40
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	325.43	430.24	479.40	535.24	640.22	646.70	656.31	677.43	696.88	781.41	1387.45
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	.46	.37	.27	.23	.20	.19	.14	.17	.16	.16	.08
-4											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	A	THRIE	E	D	C	G3	B	G4W
VALUES	26.37	41.17	56.87	57.33	59.22	60.39	61.56	62.61	65.08	74.58	74.75
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	319.45	429.84	475.80	531.09	638.86	643.05	655.03	675.34	693.23	777.70	1393.55
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	.48	.37	.28	.24	.20	.19	.19	.18	.16	.16	.08
-6											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	A	THRIE	C	E	D	G3	B	G4W
VALUES	25.97	35.58	53.68	54.63	55.44	58.48	58.46	60.10	61.10	70.92	71.09
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	314.05	429.44	472.16	526.96	637.43	639.40	653.57	673.11	693.57	779.91	1374.58
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	.50	.37	.29	.25	.20	.19	.19	.18	.17	.17	.09
-8											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	A	THRIE	G4S	C	E	D	G3	B	G4W
VALUES	25.56	31.41	50.51	52.12	52.42	54.88	57.39	57.61	58.47	67.68	67.85
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	309.89	429.03	468.99	523.36	635.86	636.16	651.95	670.89	686.33	770.59	1376.09
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	.51	.37	.30	.26	.20	.20	.20	.19	.17	.17	.09

A.305

D-8-8

D-8-10

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 8-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 18 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 152.56
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	A	THRIE	G3	C	B	G4W
VALUES	29.49	40.38	66.88	67.75	70.29	74.62	76.51	83.63	85.24	94.58	94.77
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	318.85	432.96	493.10	553.22	648.77	661.22	663.06	685.35	713.25	794.98	1402.10
BENEFIT/COST	G1	G2	A	C	D	E	G4S	THRIE	B	G4W	G3
VALUES	.40	.31	.19	.14	.14	.14	.14	.11	.10	.09	.05
8 STATE COST	G1	G2	A	C	R	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	A	THRIE	G3	C	B	G4W
VALUES	28.97	38.14	65.94	67.13	68.70	73.03	75.14	82.01	82.80	92.39	92.58
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	316.61	432.44	491.51	551.27	647.18	660.61	660.87	684.42	711.06	793.62	1400.49
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.41	.31	.19	.15	.14	.14	.14	.11	.11	.10	.05
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	A	THRIE	G3	C	B	G4W
VALUES	28.48	36.18	64.92	66.47	67.20	71.28	73.50	80.17	80.18	90.05	90.23
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	314.65	431.95	489.76	548.64	645.68	658.52	659.95	683.39	708.71	791.97	1398.65
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.42	.31	.19	.15	.15	.15	.14	.11	.11	.10	.05
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	A	THRIE	G3	C	B	G4W
VALUES	28.02	34.50	63.74	65.74	65.77	69.29	71.52	77.30	78.04	87.50	87.69
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	312.98	431.49	487.76	545.28	644.25	655.98	659.21	682.22	706.16	784.99	1396.51
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.42	.31	.20	.16	.15	.15	.14	.11	.11	.10	.06
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	A	THRIE	G3	C	B	G4W
VALUES	27.58	33.10	62.39	64.40	64.91	66.94	69.13	74.15	75.49	84.71	84.90
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	311.57	431.06	485.42	542.62	642.68	653.19	658.38	680.86	703.37	787.60	1393.97
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.43	.31	.20	.17	.15	.15	.15	.12	.12	.11	.06

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 8-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 18 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 152.56

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	SOCIETAL COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
27.17	VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
27.17	SOCIETAL COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
310.44	VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
310.44	SOCIETAL COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
310.44	VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
310.44	SOCIETAL COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3

-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	SOCIETAL COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
26.77	VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
26.77	SOCIETAL COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
309.55	VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
309.55	SOCIETAL COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
309.55	VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
309.55	SOCIETAL COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3

-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	SOCIETAL COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
26.37	VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
26.37	SOCIETAL COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
308.89	VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
308.89	SOCIETAL COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
308.89	VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
308.89	SOCIETAL COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3

-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	SOCIETAL COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
25.97	VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
25.97	SOCIETAL COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
308.41	VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
308.41	SOCIETAL COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
308.41	VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
308.41	SOCIETAL COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3

-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	SOCIETAL COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
25.56	VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
25.56	SOCIETAL COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
308.03	VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
308.03	SOCIETAL COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
308.03	VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
308.03	SOCIETAL COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3

A.307

D-8-10

D-8-12

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 8-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 20 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 133.92
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	A	THRIE	G3	C	B	G4W
VALUES	29.49	30.66	66.88	67.75	70.29	74.62	76.51	83.39	85.24	94.58	94.77
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	309.14	432.96	493.10	553.72	638.77	661.22	663.06	685.35	713.25	794.90	1401.87
BENEFIT/COST	G1	G2	A	D	E	G4S	C	THRIE	B	G4W	G3
VALUES	.37	.26	.14	.11	.11	.11	.10	.08	.07	.06	.04
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	A	THRIE	G3	C	B	G4W
VALUES	28.97	30.43	65.94	67.13	68.70	73.03	75.14	81.90	82.80	92.39	92.58
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	308.90	432.44	491.51	551.27	637.18	660.61	660.87	684.42	711.06	793.62	1400.38
BENEFIT/COST	G1	G2	A	E	D	G4S	C	THRIE	B	G4W	G3
VALUES	.37	.26	.15	.11	.11	.11	.11	.08	.07	.07	.04
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	A	THRIE	G3	C	B	G4W
VALUES	28.48	30.26	64.92	66.47	67.20	71.26	73.50	80.13	80.17	90.05	90.23
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	308.74	431.95	484.76	548.64	635.68	658.52	659.95	683.39	708.71	791.97	1398.61
BENEFIT/COST	G1	G2	A	E	C	D	G4S	THRIE	B	G4W	G3
VALUES	.37	.26	.15	.12	.11	.11	.11	.08	.08	.07	.04
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	A	THRIE	G3	C	B	G4W
VALUES	28.02	30.14	63.74	65.74	65.77	69.29	71.52	77.30	78.02	87.50	87.69
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	308.62	431.49	487.76	545.78	634.25	655.98	659.21	682.22	706.16	789.49	1346.50
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.37	.26	.15	.12	.12	.11	.11	.09	.08	.07	.04
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	A	THRIE	G3	C	B	G4W
VALUES	27.58	30.05	62.39	64.40	64.91	66.94	69.13	74.15	75.99	84.71	84.90
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	308.52	431.06	485.42	542.62	632.88	653.19	658.38	680.86	703.37	787.60	1393.97
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.37	.26	.16	.13	.12	.12	.12	.09	.09	.08	.04

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 8-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 20 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 133.92

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

0	STATE COST	G1	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	G4W	G4S	THRIE	G3
	VALUES	G2	27.17	29.95	60.80	63.07	63.95	64.16	66.27	70.64	70.64	C	G3	B	G4W
	SOCIETAL COST	G1	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	G4W	G4S	THRIE	G3
	VALUES	G2	27.17	29.95	60.80	63.07	63.95	64.16	66.27	70.64	70.64	C	G3	B	G4W
	TOTAL COST	G1	308.43	430.64	482.64	539.12	641.54	650.10	657.43	679.27	679.27	G4S	G4W	THRIE	G3
	VALUES	G2	308.43	430.64	482.64	539.12	641.54	650.10	657.43	679.27	679.27	G4S	G4W	THRIE	G3
	BENEFIT/COST	G1	.37	.26	.17	.14	.12	.12	.12	.09	.09	G4W	G4S	THRIE	G3
	VALUES	G2	.37	.26	.17	.14	.12	.12	.12	.09	.09	G4W	G4S	THRIE	G3

-2	STATE COST	G1	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	G4W	G4S	THRIE	G3
	VALUES	G2	26.77	29.85	58.95	60.93	61.74	62.84	62.94	66.77	66.77	C	G3	B	G4W
	SOCIETAL COST	G1	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	G4W	G4S	THRIE	G3
	VALUES	G2	26.77	29.85	58.95	60.93	61.74	62.84	62.94	66.77	66.77	C	G3	B	G4W
	TOTAL COST	G1	308.33	430.24	479.40	535.24	640.22	646.70	656.31	677.43	677.43	G4S	G4W	THRIE	G3
	VALUES	G2	308.33	430.24	479.40	535.24	640.22	646.70	656.31	677.43	677.43	G4S	G4W	THRIE	G3
	BENEFIT/COST	G1	.37	.27	.17	.14	.12	.12	.12	.10	.10	G4W	G4S	THRIE	G3
	VALUES	G2	.37	.27	.17	.14	.12	.12	.12	.10	.10	G4W	G4S	THRIE	G3

-4	STATE COST	G1	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	G4W	G4S	THRIE	G3
	VALUES	G2	26.37	29.74	56.87	57.33	59.22	60.39	61.56	62.61	62.61	C	G3	B	G4W
	SOCIETAL COST	G1	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	G4W	G4S	THRIE	G3
	VALUES	G2	26.37	29.74	56.87	57.33	59.22	60.39	61.56	62.61	62.61	C	G3	B	G4W
	TOTAL COST	G1	308.22	429.84	475.80	531.09	638.84	643.05	655.03	675.34	675.34	G4S	G4W	THRIE	G3
	VALUES	G2	308.22	429.84	475.80	531.09	638.84	643.05	655.03	675.34	675.34	G4S	G4W	THRIE	G3
	BENEFIT/COST	G1	.37	.27	.18	.15	.13	.12	.12	.10	.10	G4W	G4S	THRIE	G3
	VALUES	G2	.37	.27	.18	.15	.13	.12	.12	.10	.10	G4W	G4S	THRIE	G3

-6	STATE COST	G1	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	G4W	G4S	THRIE	G3
	VALUES	G2	25.97	29.60	53.68	54.63	55.44	58.48	58.48	60.10	60.10	C	G3	B	G4W
	SOCIETAL COST	G1	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	G4W	G4S	THRIE	G3
	VALUES	G2	25.97	29.60	53.68	54.63	55.44	58.48	58.48	60.10	60.10	C	G3	B	G4W
	TOTAL COST	G1	304.08	429.44	472.16	526.96	637.43	643.40	653.57	673.11	673.11	G4S	G4W	THRIE	G3
	VALUES	G2	304.08	429.44	472.16	526.96	637.43	643.40	653.57	673.11	673.11	G4S	G4W	THRIE	G3
	BENEFIT/COST	G1	.37	.27	.19	.16	.13	.13	.12	.11	.11	G4W	G4S	THRIE	G3
	VALUES	G2	.37	.27	.19	.16	.13	.13	.12	.11	.11	G4W	G4S	THRIE	G3

-8	STATE COST	G1	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	G4W	G4S	THRIE	G3
	VALUES	G2	25.56	29.41	50.51	52.12	52.42	54.88	57.34	57.61	57.61	C	G3	B	G4W
	SOCIETAL COST	G1	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	G4W	G4S	THRIE	G3
	VALUES	G2	25.56	29.41	50.51	52.12	52.42	54.88	57.34	57.61	57.61	C	G3	B	G4W
	TOTAL COST	G1	307.89	429.03	468.99	523.36	635.86	636.16	651.45	670.89	670.89	G4S	G4W	THRIE	G3
	VALUES	G2	307.89	429.03	468.99	523.36	635.86	636.16	651.45	670.89	670.89	G4S	G4W	THRIE	G3
	BENEFIT/COST	G1	.38	.27	.20	.17	.13	.13	.13	.12	.12	G4W	G4S	THRIE	G3
	VALUES	G2	.38	.27	.20	.17	.13	.13	.13	.12	.12	G4W	G4S	THRIE	G3

A.309

D-8-12

D-10-0

SUMMARY OF RESULTS ALL DIVIDED HIGHWAYS W/ EMBANKMENT HINGE AT 10 FT

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 10 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 97.59
 ADOT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	E	A	THRIE	G2	G3	C	B	G4W	G1
VALUES	61.89	62.03	68.54	68.57	69.55	74.50	76.76	82.51	89.99	90.16	163.26
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	441.67	477.98	487.05	550.49	647.01	655.51	658.46	680.37	708.63	788.04	1393.24
BENEFIT/COST	A	D	G4S	G2	E	THRIE	C	G3	B	G4W	G1
VALUES	.07	.06	.06	.06	.05	.04	.03	.02	.01	.01	-.24

8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	E	A	THRIE	G2	G3	C	B	G4W	G1
VALUES	60.77	61.14	66.37	67.29	68.72	70.65	75.42	79.49	87.70	87.56	161.01
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	439.49	474.13	485.77	548.47	644.84	654.82	659.17	679.24	708.34	787.20	1393.90
BENEFIT/COST	A	D	G4S	G2	E	THRIE	C	B	G3	G4W	G1
VALUES	.07	.07	.06	.06	.05	.04	.04	.02	.02	.02	-.23

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	E	A	THRIE	G2	G3	C	B	G4W	G1
VALUES	59.75	60.39	64.34	65.95	66.60	67.70	74.03	77.43	85.38	85.55	158.67
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	432.14	470.08	484.43	545.90	642.87	653.86	653.86	678.23	704.02	784.17	1392.50
BENEFIT/COST	G2	A	D	G4S	E	C	THRIE	B	G4W	G3	G1
VALUES	.08	.08	.06	.06	.06	.04	.04	.02	.02	.02	-.22

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	E	A	THRIE	G2	G3	C	B	G4W	G1
VALUES	58.74	59.74	62.29	62.60	64.48	66.43	72.44	74.77	82.49	83.16	156.13
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	434.61	485.77	482.46	543.25	641.07	651.47	653.21	677.26	701.63	784.91	1390.97
BENEFIT/COST	G2	A	D	G4S	E	C	THRIE	B	G4W	G3	G1
VALUES	.09	.08	.06	.06	.06	.05	.04	.03	.02	.02	-.21

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	A	THRIE	G3	C	B	G4W	G1
VALUES	57.64	57.79	59.12	60.46	62.78	64.85	70.71	71.44	80.47	80.64	153.36
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	431.84	461.11	481.25	540.42	639.43	648.95	652.60	676.26	699.11	783.33	1389.18
BENEFIT/COST	G2	A	D	G4S	E	C	THRIE	B	G4W	G3	G1
VALUES	.10	.08	.06	.06	.06	.05	.05	.03	.03	.02	-.20

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ EMBANKMENT HINGE AT 10 FT

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 10 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 97.59

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

0 STATE COST		G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	A	THRIE	G3	C	B	G4W	G1	G1
VALUES	52.53	56.67	58.48	59.43	60.72	62.86	68.55	68.85	77.74	77.90	150.29	150.29
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3	G3
VALUES	428.76	459.00	479.19	537.33	637.41	646.21	651.96	675.15	696.37	781.34	1387.02	1387.02
BENEFIT/COST	G2	A	G4S	E	D	C	THRIE	B	G4W	G3	G1	G1
VALUES	.11	.09	.07	.07	.07	.06	.05	.03	.03	.02	.19	.19

-2 STATE COST		G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	A	THRIE	C	G3	B	G4W	G1	G1
VALUES	46.85	54.35	57.76	58.00	60.37	65.40	65.89	74.70	74.86	146.83	146.83	146.83
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3	G3
VALUES	425.30	450.33	476.67	533.88	636.48	643.18	651.23	673.82	693.34	778.65	1384.37	1384.37
BENEFIT/COST	G2	A	C	E	D	G4S	THRIE	B	G4W	G3	G1	G1
VALUES	.13	.09	.07	.07	.07	.05	.04	.04	.04	.02	.18	.18

-4 STATE COST		G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	E	D	THRIE	C	G3	B	G4W	G1	G1
VALUES	40.57	53.77	55.14	56.53	56.90	57.33	61.54	62.68	71.33	71.49	142.90	142.90
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3	G3
VALUES	421.38	447.05	473.62	530.02	635.11	639.80	650.37	672.24	694.96	775.80	1381.15	1381.15
BENEFIT/COST	G2	A	C	E	D	THRIE	B	G4W	G3	G1	G1	G1
VALUES	.14	.10	.08	.07	.07	.07	.06	.05	.04	.03	.16	.16

-6 STATE COST		G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	G4S	THRIE	E	D	C	G3	B	G4W	G1	G1
VALUES	33.93	51.65	51.94	53.82	55.31	55.89	57.38	58.99	67.69	67.84	138.47	138.47
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3	G3
VALUES	416.95	437.41	470.13	525.85	633.78	636.16	649.36	670.41	696.32	772.30	1377.45	1377.45
BENEFIT/COST	G2	A	C	E	D	THRIE	B	G4W	G3	G1	G1	G1
VALUES	.16	.11	.09	.07	.07	.07	.06	.05	.05	.03	.15	.15

-8 STATE COST		G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	G4S	THRIE	C	E	D	G3	B	G4W	G1	G1
VALUES	27.80	48.14	49.99	50.28	53.33	53.99	54.72	55.26	64.13	64.28	133.63	133.63
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3	G3
VALUES	412.10	431.28	466.61	521.80	632.47	632.61	648.20	668.47	682.76	768.76	1373.74	1373.74
BENEFIT/COST	G2	A	C	E	D	THRIE	B	G4W	G3	G1	G1	G1
VALUES	.17	.12	.09	.08	.07	.07	.06	.05	.05	.03	.13	.13

A.311

D-10-0

D-10-2

SUMMARY OF RESULTS ALL DIVIDED HIGHWAYS W/ 10-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 231.79
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	D	G3	C	A	G4S	E	B	G4W	G4W	G2	G1
VALUES	84.28	115.22	115.67	121.02	146.78	156.81	156.99	174.28	174.45	174.45	185.72	241.80
TOTAL COST	G1	A	G2	C	D	E	B	G4S	G4W	G4W	THRIE	G3
VALUES	520.27	565.26	589.19	589.50	708.70	735.47	742.76	775.29	792.92	792.92	802.76	1434.15
BENEFIT/COST	C	THRIE	A	D	E	G4S	G2	B	G4W	G4W	G3	G1
VALUES	.24	.21	.20	.20	.13	.12	.11	.10	.09	.09	.04	-.04

8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	D	G3	C	A	G4S	E	B	G4W	G4W	G2	G1
VALUES	81.08	111.25	111.93	116.09	144.86	153.75	154.12	171.22	171.38	171.38	182.54	241.81
TOTAL COST	G1	A	C	G2	D	E	B	G4S	G4W	G4W	THRIE	G3
VALUES	520.29	563.34	584.56	585.02	704.73	732.59	739.69	772.22	789.86	789.86	799.56	1430.40
BENEFIT/COST	C	THRIE	A	D	E	G4S	G2	B	G4W	G4W	G3	G1
VALUES	.25	.21	.21	.20	.13	.13	.12	.11	.10	.10	.09	-.04

6	STATE COST	G1	G2	A	C	H	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	D	G3	C	A	G4S	E	B	G4W	G4W	G2	G1
VALUES	77.84	106.99	107.77	110.77	142.51	150.33	150.45	167.66	167.83	167.83	178.86	241.83
TOTAL COST	G1	A	C	G2	D	E	B	G4S	G4W	G4W	THRIE	G3
VALUES	520.31	560.98	579.25	582.34	700.46	729.42	736.14	768.91	786.31	786.31	796.32	1426.25
BENEFIT/COST	C	THRIE	A	D	E	G4S	G2	B	G4W	G4W	G3	G1
VALUES	.26	.21	.21	.21	.14	.13	.13	.11	.10	.10	.09	-.04

4	STATE COST	G1	G2	A	C	R	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	D	G3	C	A	G4S	E	B	G4W	G4W	G2	G1
VALUES	74.53	102.36	103.11	105.01	139.60	146.46	147.39	163.50	163.67	163.67	174.53	241.86
TOTAL COST	G1	A	C	G2	D	E	B	G4S	G4W	G4W	THRIE	G3
VALUES	520.33	558.08	573.49	578.01	695.84	725.87	731.98	764.93	782.14	782.14	793.01	1421.59
BENEFIT/COST	C	THRIE	A	D	E	G2	G4S	B	G4W	G4W	G3	G1
VALUES	.27	.22	.22	.22	.15	.14	.14	.12	.11	.11	.10	-.04

2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	THRIE	D	G3	C	A	G4S	E	B	G4W	G4W	G2	G1
VALUES	71.10	97.28	97.82	98.71	135.97	141.97	143.32	158.57	158.73	158.73	169.38	241.89
TOTAL COST	G1	A	C	G2	D	E	B	G4S	G4W	G4W	THRIE	G3
VALUES	520.37	554.44	567.18	572.86	690.75	721.90	727.05	760.44	777.21	777.21	789.58	1416.30
BENEFIT/COST	C	THRIE	A	D	E	G2	G4S	B	G4W	G4W	G3	G1
VALUES	.28	.23	.23	.22	.15	.15	.15	.13	.12	.12	.10	-.04

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 10-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 231.79
 ADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

9 10 11

0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	D	G3	G3	A	G4S	E	B	G4W	G2	G1
	VALUES	67.48	91.61	91.73	91.74	131.40	136.68	138.57	152.67	152.83	163.17	241.93
	TOTAL COST	G1	A	C	G2	D	E	B	G4S	G4W	THRIE	G3
	VALUES	520.40	549.88	560.20	566.65	685.08	717.05	721.14	755.16	771.30	785.45	1410.21
	BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1
	VALUES	.30	.24	.24	.23	.17	.16	.15	.14	.13	.11	-.04

-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	B	G4W	G2	G1
	VALUES	63.59	83.93	84.68	85.21	125.69	130.39	132.97	145.57	145.73	155.67	241.98
	TOTAL COST	G1	A	C	G2	D	E	B	G4S	G4W	THRIE	G3
	VALUES	520.45	544.17	552.41	559.14	678.69	711.45	714.05	748.87	764.21	782.07	1403.16
	BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1
	VALUES	.32	.25	.25	.23	.19	.17	.16	.15	.14	.11	-.04

-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	B	G4W	G2	G1
	VALUES	59.42	75.26	76.59	78.05	118.68	122.97	126.40	137.16	137.31	146.71	242.03
	TOTAL COST	G1	A	C	G2	D	E	B	G4S	G4W	THRIE	G3
	VALUES	520.51	537.16	543.74	550.19	671.52	704.86	705.63	741.45	755.79	777.90	1395.07
	BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1
	VALUES	.33	.27	.26	.24	.21	.18	.18	.17	.15	.12	-.04

-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	B	G4W	G2	G1
	VALUES	55.06	66.02	67.75	70.33	110.51	114.55	118.93	127.59	127.75	136.49	242.10
	TOTAL COST	G1	A	C	G2	D	E	B	G4S	G4W	THRIE	G3
	VALUES	520.57	528.99	534.49	539.97	663.81	696.07	697.41	733.02	746.22	773.54	1386.23
	BENEFIT/COST	C	A	D	THRIE	G2	E	G4S	B	G4W	G3	G1
	VALUES	.35	.29	.27	.25	.24	.20	.19	.18	.17	.12	-.04

-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	THRIE	C	G3	D	A	G4S	E	B	G4W	G2	G1
	VALUES	50.93	57.32	59.31	62.47	101.98	105.84	111.14	117.81	117.96	125.98	242.17
	TOTAL COST	A	G1	C	G2	D	E	B	G4S	G4W	THRIE	G3
	VALUES	520.46	520.64	525.80	534.46	656.44	686.29	689.62	724.31	736.44	769.40	1377.79
	BENEFIT/COST	C	A	D	G2	THRIE	E	G4S	B	G4W	G3	G1
	VALUES	.37	.31	.28	.26	.25	.21	.20	.20	.18	.13	-.04

A.313

D-10-2

D-10-4

SUMMARY OF RESULTS ALL DIVIDED HIGHWAYS W/ 10-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 200.87
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	A	THRIE	G2	G3	E	C	B	G4W	G1
VALUES	61.66	61.82	68.57	70.41	74.50	76.76	81.69	82.51	90.03	90.20	214.33
TOTAL COST	G2	A	G1	C	D	B	E	G4S	G4W	THRIE	G3
VALUES	477.98	487.05	492.80	550.49	655.30	658.51	660.17	680.13	708.68	788.89	1395.24
BENEFIT/COST	A	G2	C	D	G4S	E	B	THRIE	G4W	G3	G1
VALUES	.32	.31	.25	.23	.23	.21	.19	.18	.18	.04	-.05
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	A	THRIE	G2	G3	E	C	H	G4W	G1
VALUES	60.63	61.02	67.29	69.21	70.65	75.42	77.64	79.99	87.72	87.89	213.64
TOTAL COST	G2	A	G1	C	D	E	B	G4S	G4W	THRIE	G3
VALUES	474.13	485.77	492.11	548.47	654.50	656.12	656.20	679.11	706.36	787.69	1393.90
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3	G1
VALUES	.32	.32	.26	.24	.23	.21	.20	.18	.18	.10	-.05
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	A	G2	THRIE	E	G3	C	B	G4W	G1
VALUES	59.69	60.33	65.95	66.60	67.94	73.80	74.03	77.43	85.39	85.56	212.88
TOTAL COST	G2	A	G1	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	470.08	484.43	491.36	545.90	652.28	653.80	653.87	678.16	704.03	786.42	1392.50
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3	G1
VALUES	.33	.32	.26	.24	.23	.22	.20	.19	.19	.10	-.04
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	G2	A	THRIE	E	G3	C	B	G4W	G1
VALUES	58.76	59.71	62.29	64.48	66.53	70.20	72.49	74.77	83.00	83.16	212.06
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	465.77	482.96	490.54	543.25	648.68	651.48	653.19	677.23	701.64	785.01	1390.97
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3	G1
VALUES	.34	.33	.27	.24	.23	.23	.21	.19	.19	.10	-.04
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	A	THRIE	E	G3	C	B	G4W	G1
VALUES	57.64	57.78	59.12	62.78	64.88	66.87	70.71	71.94	80.48	80.64	211.15
TOTAL COST	G2	A	G1	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	461.11	481.25	489.63	540.42	645.35	648.95	652.59	676.26	699.11	783.36	1389.18
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G3	G1
VALUES	.36	.33	.28	.24	.23	.23	.21	.19	.19	.10	-.04

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 10-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 200.87
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
0	STATE COST	G1	G2	A	C	A	E	D	G4S	THRIE G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48
	SOCIETAL COST	G2	G4S	D	A	THRIE	E	G3	A	G4W G1
	VALUES	52.53	56.67	58.48	60.72	62.87	63.82	68.55	72.74	77.90
	TOTAL COST	G2	A	G1	C	E	B	D	G4S	THRIE G3
	VALUES	456.00	479.19	488.62	537.33	642.29	646.21	651.96	696.38	781.34
	BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G3 G1
	VALUES	.37	.33	.28	.24	.24	.22	.22	.19	.10

-2	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48
	SOCIETAL COST	G2	G4S	D	A	THRIE	E	C	B	G4W G1
	VALUES	46.85	55.35	57.76	58.20	60.37	61.07	65.40	74.70	74.86
	TOTAL COST	G2	A	G1	C	E	B	D	G4S	THRIE G3
	VALUES	450.33	476.67	487.50	533.88	639.54	643.18	651.23	693.54	778.85
	BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G3 G1
	VALUES	.38	.34	.29	.24	.24	.22	.22	.20	.10

A.315

-4	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48
	SOCIETAL COST	G2	G4S	A	D	THRIE	E	C	B	G4W G1
	VALUES	40.57	53.77	55.14	56.90	57.33	58.63	61.54	71.33	71.49
	TOTAL COST	G2	A	G1	C	E	A	D	G4S	THRIE G3
	VALUES	444.05	473.62	486.23	530.02	637.10	639.80	650.37	689.96	775.80
	BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G3 G1
	VALUES	.40	.35	.30	.25	.24	.24	.23	.20	.10

-6	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48
	SOCIETAL COST	G2	A	G4S	THRIE	D	E	C	B	G4W G1
	VALUES	33.93	51.65	51.94	53.82	55.89	56.49	57.38	67.69	67.84
	TOTAL COST	G2	A	G1	C	E	B	D	G4S	THRIE G3
	VALUES	437.41	470.13	484.79	525.85	634.96	636.16	649.36	670.41	722.30
	BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G3 G1
	VALUES	.41	.36	.31	.25	.24	.24	.23	.20	.11

-8	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48
	SOCIETAL COST	G2	A	G4S	THRIE	C	E	D	B	G4W G1
	VALUES	27.80	48.14	49.99	50.28	53.33	54.61	54.72	64.13	64.28
	TOTAL COST	G2	A	G1	C	B	E	D	G4S	THRIE G3
	VALUES	431.28	466.61	483.10	521.80	632.61	633.08	648.20	682.76	768.76
	BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G3 G1
	VALUES	.43	.36	.31	.25	.24	.24	.24	.21	.11

D-10-4

D-10-6

SUMMARY OF RESULTS ALL DIVIDED HIGHWAYS W/ 10-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 5 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 174.68
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
10	STATE COST	G1	G2	A	C	B	D	E	G4S	G3
VALUES	278.48	403.48	418.48	468.48	568.48	593.48	578.48	618.48	618.48	718.48
SOCIETAL COST	G2	G4S	D	E	A	THRIE	G3	C	B	G4W
VALUES	27.47	61.89	62.03	68.54	69.33	69.56	76.76	81.70	89.21	89.37
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE
VALUES	427.61	431.97	487.80	550.18	647.01	655.51	652.68	680.37	707.85	788.04
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1
VALUES	.36	.25	.20	.19	.18	.18	.15	.15	.14	.09

8	STATE COST	G1	G2	A	C	B	D	E	G4S	G3
VALUES	278.48	403.48	418.48	468.48	568.48	593.48	578.48	618.48	618.48	718.48
SOCIETAL COST	G2	G4S	D	E	A	THRIE	G3	C	B	G4W
VALUES	27.47	60.77	61.14	66.37	67.72	68.72	75.42	79.53	87.25	87.42
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE
VALUES	426.74	430.94	486.20	548.00	644.84	654.62	655.72	679.24	705.89	787.20
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1
VALUES	.36	.26	.20	.19	.19	.18	.15	.15	.14	.09

6	STATE COST	G1	G2	A	C	B	D	E	G4S	G3
VALUES	278.48	403.48	418.48	468.48	568.48	593.48	578.48	618.48	618.48	718.48
SOCIETAL COST	G2	G4S	D	E	A	THRIE	G3	C	B	G4W
VALUES	26.61	59.75	60.39	64.39	66.17	67.70	74.03	77.20	85.16	85.32
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE
VALUES	425.69	430.08	484.65	545.67	642.87	653.63	653.86	678.23	703.80	786.17
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1
VALUES	.37	.26	.21	.19	.19	.19	.16	.15	.14	.10

4	STATE COST	G1	G2	A	C	B	D	E	G4S	G3
VALUES	278.48	403.48	418.48	468.48	568.48	593.48	578.48	618.48	618.48	718.48
SOCIETAL COST	G2	G4S	D	E	A	THRIE	G3	C	B	G4W
VALUES	25.88	58.79	59.74	62.60	64.57	66.43	72.49	74.67	82.90	83.06
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE
VALUES	424.41	429.36	483.05	543.15	641.07	651.38	653.21	677.26	701.54	784.91
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1
VALUES	.37	.26	.21	.19	.19	.19	.16	.15	.15	.10

2	STATE COST	G1	G2	A	C	B	D	E	G4S	G3
VALUES	278.48	403.48	418.48	468.48	568.48	593.48	578.48	618.48	618.48	718.48
SOCIETAL COST	G2	G4S	D	E	A	THRIE	G3	C	B	G4W
VALUES	25.26	57.79	59.12	60.96	62.81	64.85	70.71	71.91	80.44	80.61
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE
VALUES	422.84	428.74	481.28	540.39	639.43	648.92	652.60	676.26	699.08	783.33
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1
VALUES	.37	.27	.22	.20	.19	.19	.17	.15	.15	.11

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 10-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 174.68

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

	1	2	3	4	5	6	7	8	9	10	11
0	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	E	A	THRIE	G3	H	G4W	G1
	VALUES	24.72	56.67	58.48	59.43	60.73	62.86	68.55	74.70	77.89	142.42
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	420.89	428.20	479.20	537.32	637.91	646.21	651.96	696.37	781.34	1587.02
	BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1	G3
	VALUES	.37	.27	.23	.20	.20	.19	.17	.16	.12	.08
-2	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	E	A	THRIE	C	H	G4W	G1
	VALUES	24.22	55.35	57.76	58.00	58.20	60.37	65.40	74.70	74.86	140.00
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	418.47	427.70	476.67	533.88	636.48	643.18	651.23	693.34	778.85	1584.37
	BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1	G3
	VALUES	.37	.28	.23	.20	.20	.19	.18	.16	.12	.08
-4	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	A	E	D	THRIE	C	H	G4W	G1
	VALUES	23.76	53.77	55.14	56.63	56.90	57.33	61.54	71.33	71.49	137.01
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	415.49	427.24	473.62	530.02	635.11	639.80	650.37	689.46	779.80	1581.15
	BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1	G3
	VALUES	.37	.29	.24	.20	.20	.20	.18	.17	.14	.08
-5	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	A	G4S	THRIE	E	D	C	H	G4W	G1
	VALUES	23.33	51.65	51.94	53.82	55.31	55.89	57.38	67.69	67.84	133.42
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	411.89	426.80	470.13	525.85	633.78	636.16	649.36	685.32	722.30	1377.46
	BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1	G3
	VALUES	.38	.29	.25	.21	.20	.20	.19	.17	.15	.09
-8	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	A	G4S	THRIE	C	E	D	H	G4W	G1
	VALUES	22.92	48.14	49.99	50.28	53.33	53.99	54.72	64.13	64.28	129.30
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	407.77	426.39	466.61	521.80	632.47	632.61	648.20	682.76	768.76	1373.74
	BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1	G3
	VALUES	.38	.30	.26	.21	.20	.20	.19	.18	.16	.09

A.317

D-10-6

D-10-8

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 10-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 18 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 152.56
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

10	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	VALUES	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G4S	D	E	A	THRIE	G3	G1	C	B	G4W	G3
28.44	VALUES	61.11	61.22	67.81	69.33	69.56	76.71	77.31	81.70	89.21	89.37	
	TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
355.79	VALUES	431.92	487.80	550.18	646.28	654.70	657.68	674.58	707.85	788.04	1395.19	
	BENEFIT/COST	G1	G2	A	C	E	D	B	THRIE	G4W	G3	
.31	VALUES	.27	.20	.15	.15	.15	.15	.12	.11	.10	.06	

8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	VALUES	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G4S	D	E	A	THRIE	G3	G1	C	B	G4W	G3
27.44	VALUES	60.32	60.68	65.95	67.72	68.72	73.49	75.40	79.53	87.25	87.42	
	TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
351.97	VALUES	430.92	486.20	548.00	644.42	654.15	655.72	678.80	705.89	787.20	1393.87	
	BENEFIT/COST	G1	G2	A	C	E	D	B	THRIE	G4W	G3	
.31	VALUES	.28	.20	.16	.15	.15	.15	.12	.11	.11	.06	

6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	VALUES	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G4S	D	E	A	THRIE	G3	G1	C	B	G4W	G3
26.59	VALUES	59.53	60.14	64.18	66.17	67.70	69.48	74.02	77.20	85.16	85.22	
	TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
347.96	VALUES	430.07	484.65	545.67	642.66	653.63	653.63	678.01	703.80	786.17	1392.49	
	BENEFIT/COST	G1	G2	A	C	E	D	B	THRIE	G4W	G3	
.31	VALUES	.30	.21	.16	.16	.15	.15	.12	.12	.11	.06	

4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	VALUES	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G4S	D	E	A	THRIE	G3	G1	C	B	G4W	G3
25.87	VALUES	58.69	59.64	62.51	64.57	65.22	66.43	72.49	74.67	82.90	83.06	
	TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
343.70	VALUES	429.35	483.05	543.15	640.99	651.36	653.11	677.17	701.54	784.91	1390.96	
	BENEFIT/COST	G1	G2	A	C	E	D	B	THRIE	G4W	G3	
.31	VALUES	.31	.21	.17	.16	.16	.15	.12	.12	.11	.06	

2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
278.48	VALUES	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G4S	D	E	A	THRIE	G3	G1	C	B	G4W	G3
25.26	VALUES	57.76	59.09	60.63	60.93	62.81	64.85	70.70	71.51	80.44	80.61	
	TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
339.10	VALUES	428.74	481.28	540.39	639.40	648.92	652.57	676.23	699.08	783.33	1389.18	
	BENEFIT/COST	G1	G2	A	C	E	D	B	THRIE	G4W	G3	
.33	VALUES	.32	.21	.17	.16	.16	.15	.13	.12	.12	.06	

A.318

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 10-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 18 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 152.56
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	A	THRIE	C	C	B	G4W
VALUES	24.72	55.59	56.66	58.48	59.43	60.73	62.86	68.55	68.84	77.73	77.89
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	334.00	428.19	479.20	537.32	637.90	646.21	651.95	675.14	696.37	781.34	1387.02
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.35	.32	.22	.18	.16	.16	.16	.13	.12	.12	.06

-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	A	THRIE	C	G3	B	G4W
VALUES	24.22	50.00	55.35	57.75	58.00	58.20	60.37	65.40	65.84	74.70	74.86
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	328.47	427.70	476.67	539.88	636.48	643.18	651.23	673.82	693.34	778.85	1384.37
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.37	.32	.23	.19	.16	.16	.16	.14	.13	.13	.07

A.319

-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	A	E	D	THRIE	C	G3	B	G4W
VALUES	23.76	43.81	53.77	55.14	56.63	56.90	57.33	61.54	62.68	71.33	71.49
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	322.29	427.24	473.62	530.02	635.11	639.80	650.37	672.24	689.96	775.80	1381.15
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.39	.32	.23	.14	.17	.16	.16	.14	.13	.13	.07

-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	A	G4S	THRIE	E	D	C	G3	B	G4W
VALUES	23.33	37.29	51.65	51.94	53.82	55.31	55.89	57.38	58.99	67.69	67.84
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	315.76	426.80	470.13	525.85	633.78	636.16	649.36	670.41	686.32	772.30	1377.46
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE	G4W	G3
VALUES	.41	.32	.24	.20	.17	.16	.16	.15	.14	.14	.07

-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	A	G4S	THRIE	C	E	D	G3	B	G4W
VALUES	22.92	31.28	48.14	49.99	50.28	53.33	53.99	54.72	55.26	64.13	64.28
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	309.76	426.39	466.61	521.80	632.47	632.61	648.20	666.47	682.76	768.76	1373.74
BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	G4W	THRIE	G3
VALUES	.44	.32	.25	.21	.17	.17	.16	.16	.14	.14	.07

D: 10-8

D-10-10

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 10-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 20 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 133.92
 ADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	A	THRIE	C	B	G4W
VALUES	27.54	44.97	61.11	61.22	67.81	69.33	69.56	76.71	89.21	89.37
TOTAL COST	G1	G2	A	C	E	D	B	G4S	THRIE	G3
VALUES	323.45	431.07	487.80	550.18	646.28	654.70	657.68	707.85	788.04	1395.19
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G3
VALUES	.32	.26	.15	.12	.12	.11	.11	.09	.07	.04
8 STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	A	THRIE	C	B	G4W
VALUES	26.95	41.83	60.32	60.68	65.95	67.72	68.72	75.40	87.25	87.42
TOTAL COST	G1	G2	A	C	E	D	B	G4S	THRIE	G3
VALUES	320.31	430.43	486.20	548.00	644.42	654.15	655.72	705.89	787.20	1393.87
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G3
VALUES	.33	.27	.16	.12	.12	.12	.12	.09	.08	.04
6 STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	A	THRIE	C	B	G4W
VALUES	26.35	38.95	59.53	60.16	64.18	66.17	67.70	74.02	85.16	85.32
TOTAL COST	G1	G2	A	C	E	D	B	G4S	THRIE	G3
VALUES	317.43	429.82	484.65	545.67	642.66	653.63	653.63	703.80	786.17	1392.49
BENEFIT/COST	G1	G2	A	D	C	E	G4S	THRIE	B	G3
VALUES	.34	.27	.16	.12	.12	.12	.12	.09	.08	.05
4 STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	A	THRIE	C	B	G4W
VALUES	25.77	36.35	58.64	59.64	62.51	64.57	66.43	72.49	82.40	83.06
TOTAL COST	G1	G2	A	C	E	D	B	G4S	THRIE	G3
VALUES	314.83	429.25	483.05	543.15	640.99	651.38	653.11	701.54	784.91	1390.96
BENEFIT/COST	G1	G2	A	C	D	E	G4S	THRIE	B	G3
VALUES	.35	.27	.17	.13	.13	.12	.12	.09	.08	.05
2 STATE COST	G1	G2	A	C	B	E	D	G4W	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	A	THRIE	C	B	G4W
VALUES	25.23	34.03	57.76	59.09	60.93	62.81	64.65	70.70	80.44	80.61
TOTAL COST	G1	G2	A	C	E	D	B	G4S	THRIE	G3
VALUES	312.51	425.70	481.28	540.39	639.40	648.92	652.57	706.23	783.33	1389.18
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G3
VALUES	.36	.27	.17	.13	.13	.13	.12	.10	.09	.05

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 10-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 20 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 133.92
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	A	THRIE	C	G3	B	G4W
VALUES	24.71	32.00	56.66	58.48	59.43	60.73	62.86	65.55	68.84	77.73	77.89
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	310.48	428.19	479.20	537.32	637.90	646.21	651.95	675.14	696.37	781.34	1387.02
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.37	.27	.17	.14	.13	.13	.12	.10	.10	.09	.05
-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	A	THRIE	C	G3	B	G4W
VALUES	24.22	30.28	55.35	57.75	58.00	58.20	60.37	65.40	65.89	74.70	74.86
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	302.75	427.70	476.67	533.88	636.48	643.18	651.23	673.82	693.34	778.85	1384.37
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.37	.27	.18	.15	.13	.13	.13	.10	.10	.10	.05
-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	A	E	D	THRIE	C	G3	B	G4W
VALUES	23.76	28.86	53.77	55.14	56.63	56.80	57.33	61.54	62.68	71.33	71.49
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	307.34	427.24	473.62	530.02	635.11	639.80	650.37	672.24	689.96	775.60	1381.15
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.38	.27	.19	.15	.13	.13	.13	.11	.11	.10	.05
-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	A	G4S	THRIE	E	D	C	G3	B	G4W
VALUES	23.33	27.77	51.65	51.94	53.82	55.31	55.89	57.38	58.99	67.69	67.84
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	306.25	426.80	470.13	525.85	633.78	636.16	649.36	670.41	686.32	772.30	1377.46
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
VALUES	.38	.27	.20	.16	.14	.13	.13	.12	.11	.11	.06
-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	A	G4S	THRIE	C	E	D	G3	B	G4W
VALUES	22.92	26.97	48.14	49.99	50.28	53.33	53.99	54.72	55.26	64.13	64.28
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	305.45	426.39	466.61	521.80	632.47	632.61	648.20	668.47	682.76	768.76	1373.74
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
VALUES	.38	.28	.20	.17	.14	.14	.13	.12	.12	.11	.06

A.321

D-10-10

D-10-12

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 10-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 22 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 116.24
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G4S	D	E	A	THRIE	G3	C	B	G4W
VALUES	27.59	61.11	61.22	67.81	69.33	69.56	75.89	81.70	89.21	89.37
TOTAL COST	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	306.32	487.80	550.18	646.28	654.70	657.68	679.58	707.85	788.04	1394.36
BENEFIT/COST	G1	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.32	.12	.10	.09	.09	.08	.07	.05	.05	.03
P STATE COST	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G4S	D	E	A	THRIE	G3	C	B	G4W
VALUES	26.95	60.32	60.68	65.95	67.72	68.72	74.93	79.53	87.25	87.42
TOTAL COST	G1	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	305.79	486.20	548.00	644.42	654.15	655.72	678.80	705.89	787.20	1393.40
BENEFIT/COST	G1	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.33	.12	.10	.09	.09	.08	.07	.05	.05	.03
5 STATE COST	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G4S	D	E	A	THRIE	G3	C	B	G4W
VALUES	26.95	59.53	60.16	64.18	66.17	67.70	73.78	77.20	85.16	85.32
TOTAL COST	G1	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	305.42	484.65	545.67	642.66	653.63	653.63	678.01	703.80	786.17	1392.26
BENEFIT/COST	G1	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.33	.12	.10	.09	.09	.07	.06	.05	.05	.03
4 STATE COST	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G4S	D	E	A	THRIE	G3	C	B	G4W
VALUES	25.77	58.69	59.64	62.51	64.57	66.43	72.39	74.67	82.90	83.06
TOTAL COST	G1	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	305.19	483.05	543.15	640.99	651.38	653.11	677.17	701.54	784.91	1390.86
BENEFIT/COST	G1	A	D	E	G4S	C	THRIE	B	G4W	G3
VALUES	.33	.13	.10	.10	.10	.09	.07	.06	.06	.03
2 STATE COST	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G4S	D	E	A	THRIE	G3	C	B	G4W
VALUES	25.23	57.76	59.09	60.93	62.81	64.85	70.67	71.91	80.44	80.61
TOTAL COST	G1	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	305.04	481.28	540.39	639.40	648.22	652.57	676.23	699.08	783.33	1389.15
BENEFIT/COST	G1	A	D	E	C	G4S	THRIE	B	G4W	G3
VALUES	.33	.13	.10	.10	.10	.10	.07	.07	.06	.04

A.322

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 10-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 22 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 118.24

ADOT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

OF CURVE												
	1	2	3	4	5	6	7	8	9	10	11	
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3	
	278.48	403.48	418.48	488.48	568.48	578.48	593.48	618.48	618.48	718.48	1316.48	
SOCIAL COST	G2	G1	G4S	D	E	A	THRIE	G3	C	B	G4W	
	24.71	26.48	56.66	58.48	59.43	60.73	62.86	68.54	68.84	77.23	74.84	
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3	
	304.96	428.19	479.20	537.32	637.90	646.21	651.95	675.14	696.37	781.34	1387.01	
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3	
	.33	.23	.14	.11	.10	.10	.10	.08	.07	.07	.04	

-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	488.48	568.48	578.48	593.48	618.48	618.48	718.48	1316.48
	SOCIETAL COST	G2	G1	G4S	D	E	A	THRIE	C	G3	B	G4W
	VALUES	24.22	26.42	55.35	57.75	58.00	58.20	60.37	65.40	65.89	74.70	74.86
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	304.89	427.70	476.67	533.88	636.48	643.18	651.23	673.82	693.34	778.85	1384.37
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
	VALUES	.33	.23	.14	.11	.10	.10	.10	.08	.08	.07	.04

A.323

-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	488.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	G4S	A	E	D	THRIE	C	G3	B	G4W
	VALUES	23.76	26.36	53.77	55.14	56.63	56.90	57.33	61.54	62.68	71.33	71.44
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	304.83	427.24	473.62	530.02	635.11	639.80	650.37	672.24	689.96	775.80	1381.15
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
	VALUES	.33	.23	.15	.12	.11	.10	.10	.08	.08	.08	.04

-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	488.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G1	A	G4S	THRIE	E	D	C	G3	B	G4W
	VALUES	23.33	26.29	51.65	51.94	53.82	55.31	55.89	57.38	58.49	67.69	67.84
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	304.76	426.80	470.13	525.85	633.78	636.16	649.36	670.41	685.32	772.30	1377.46
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
	VALUES	.33	.24	.16	.13	.11	.11	.11	.09	.09	.08	.04

-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	488.48	568.48	578.48	593.48	618.48	618.48	718.48	1316.48
	SOCIETAL COST	G2	G1	A	G4S	THRIE	C	E	D	G3	B	G4W
	VALUES	22.92	26.20	48.14	49.99	50.28	53.33	53.99	54.72	55.26	64.13	64.28
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	304.67	426.34	466.61	521.80	632.47	632.61	648.20	668.47	682.76	768.76	1373.74
	BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
	VALUES	.33	.24	.17	.14	.11	.11	.11	.10	.09	.09	.05

D-10-12

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ EMBANKMENT HINGE AT 12 FT

D-12-0

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 84.36

ADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

10	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	0	G4S	THRIE	A	E	G3	G2	C	B	B	G4W	G1
VALUES	56.70	57.00	62.08	62.46	66.38	69.88	74.63	78.50	84.53	84.53	154.66	154.66
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	G4W	THRIE	G3
VALUES	429.13	478.10	481.44	546.93	644.86	650.17	653.01	675.48	703.16	703.16	780.56	1386.35
BENEFIT/COST	A	D	G4S	E	THRIE	G2	C	G3	B	B	G4W	G1
VALUES	.05	.05	.04	.03	.03	.02	.01	.01	.00	.00	.00	.24

11	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	0	G4S	THRIE	A	E	G3	G2	C	B	B	G4W	G1
VALUES	55.47	55.59	61.52	61.65	63.87	69.49	71.13	76.04	82.27	82.27	148.75	148.75
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	G4W	THRIE	G3
VALUES	427.27	474.60	480.13	544.51	642.34	648.94	650.25	674.07	700.90	700.90	774.49	1386.97
BENEFIT/COST	A	D	G4S	E	G2	THRIE	C	G3	B	B	G4W	G1
VALUES	.05	.05	.05	.04	.03	.03	.02	.01	.00	.00	.00	.23

12	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	0	G4S	THRIE	A	E	G3	G2	C	B	B	G4W	G1
VALUES	54.37	54.45	60.38	60.85	61.54	67.17	67.40	73.56	80.01	80.01	146.80	146.80
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	G4W	THRIE	G3
VALUES	425.27	470.88	478.86	542.04	640.02	647.92	648.49	672.84	698.63	698.63	779.33	1385.84
BENEFIT/COST	A	D	G4S	G2	E	THRIE	C	G3	B	B	G4W	G1
VALUES	.05	.05	.05	.04	.04	.03	.02	.01	.01	.01	.01	.22

13	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	0	G4S	THRIE	A	E	THRIE	G2	G3	C	B	G4W	G1
VALUES	53.32	53.63	59.10	59.42	60.03	63.42	65.85	71.05	77.73	77.73	144.64	144.64
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	G4W	THRIE	G3
VALUES	423.11	466.89	477.58	539.52	637.90	646.21	647.11	671.80	696.35	696.35	778.50	1384.33
BENEFIT/COST	A	D	G4S	G4S	E	THRIE	C	G3	B	B	G4W	G1
VALUES	.06	.05	.05	.05	.04	.03	.03	.01	.01	.01	.01	.22

14	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	0	G4S	THRIE	A	E	THRIE	G2	G3	C	B	G4W	G1
VALUES	52.39	52.49	57.50	57.75	58.98	59.11	64.46	68.44	75.39	75.39	142.29	142.29
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	G4W	THRIE	G3
VALUES	420.76	462.59	476.22	536.92	635.98	646.47	646.87	670.87	694.01	694.01	777.46	1382.93
BENEFIT/COST	A	D	G4S	G4S	E	THRIE	C	B	B	B	G4W	G1
VALUES	.06	.06	.05	.05	.05	.04	.03	.02	.02	.02	.01	.21

A.324

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ EMBANKMENT HINGE AT 12 FT

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 0 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 84.36

ADOT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

OF CURVE												
1	2	3	4	5	6	7	8	9	10	11		
0 STATE COST												
G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3		
278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48		
SOCIETAL COST												
G4S	D	G2	E	A	THRIE	G3	C	B	G4W	G1		
51.50	52.45	54.38	55.76	56.19	57.64	62.87	65.67	72.91	73.05	139.64		
TOTAL COST												
G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3		
418.17	457.96	474.67	534.14	634.24	641.39	645.93	669.48	691.53	776.11	1381.34		
BENEFIT/COST												
G2	A	D	G4S	E	C	THRIE	B	G4W	G3	G1		
.07	.07	.05	.05	.05	.04	.04	.02	.02	.02	-.20		

-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	E	A	THRIE	G3	C	B	G4W	G1
	VALUES	49.09	51.53	51.93	54.15	54.29	55.87	60.92	62.60	70.20	70.34	136.79
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	415.27	452.56	472.76	531.07	632.62	638.67	645.41	669.00	688.81	774.35	1379.34
	BENEFIT/COST	G2	A	G4S	D	E	C	THRIE	B	G4W	G3	G1
	VALUES	.09	.07	.05	.05	.05	.05	.04	.02	.02	.02	-.14

A.325

-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	A	E	THRIE	G3	C	B	G4W	G1
	VALUES	43.08	49.36	51.35	51.89	52.53	53.57	58.44	59.12	67.14	67.28	133.50
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	411.98	446.56	470.36	527.59	631.11	635.62	644.83	667.84	685.76	772.05	1376.92
	BENEFIT/COST	G2	A	G4S	D	E	C	THRIE	B	G4W	G3	G1
	VALUES	.10	.09	.06	.06	.05	.05	.04	.03	.03	.02	-.18

-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	A	D	THRIE	E	C	G3	B	G4W	G1
	VALUES	36.32	47.43	48.89	50.65	50.65	51.14	55.17	55.35	63.64	63.83	129.75
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	408.23	439.79	467.37	523.65	629.67	637.17	644.13	666.40	682.31	769.13	1373.82
	BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
	VALUES	.12	.08	.06	.05	.06	.05	.05	.04	.03	.02	-.16

-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	A	G4S	THRIE	D	E	C	G3	B	G4W	G1
	VALUES	29.22	45.46	46.26	47.28	49.82	49.83	50.94	51.29	60.01	60.15	125.55
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
	VALUES	404.02	432.69	463.93	519.41	628.31	628.44	643.29	664.74	678.62	765.76	1370.27
	BENEFIT/COST	G2	A	C	G4S	E	D	THRIE	B	G4W	G3	G1
	VALUES	.14	.09	.07	.06	.06	.06	.05	.04	.04	.02	-.15

D-12-0

D-12-2

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 12-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 200.87
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1	2	3	4	5	6	7	8	9	10	11
10	STATE COST VALUES SOCIETAL COST VALUES TOTAL COST VALUES BENEFIT/COST VALUES	G1 278.48 THRIE 82.33 G1 487.47 C .18	A 418.48 D 113.33 G2 572.65 THRIE .17	C 468.48 C 117.95 C 586.42 D .15	B 568.48 A 131.12 D 706.80 E .09	E 578.48 E 145.93 E 724.40 G4S .09	D 593.48 G4S 146.06 B 729.25 G2 .08	G4S 618.48 B 160.77 G4S 774.39 G3 .07	THRIE 718.48 G2 169.17 THRIE 800.80 G4W .06	G3 1318.48 G1 208.99 G3 1428.03 G1 -.03
8	STATE COST VALUES SOCIETAL COST VALUES TOTAL COST VALUES BENEFIT/COST VALUES	G1 278.48 THRIE 79.21 G1 487.48 C .19	A 418.48 D 109.87 G2 570.45 THRIE .17	C 468.48 C 113.77 C 582.25 D .15	B 568.48 A 129.86 D 703.34 E .10	E 578.48 E 143.57 E 722.04 G4S .09	D 593.48 G4S 143.59 B 727.03 G2 .08	G4S 618.48 B 158.56 G4S 772.18 G3 .07	THRIE 718.48 G2 166.97 THRIE 797.68 G4W .07	G3 1318.48 G1 209.00 G3 1424.48 G1 -.03
6	STATE COST VALUES SOCIETAL COST VALUES TOTAL COST VALUES BENEFIT/COST VALUES	G1 278.48 THRIE 74.03 G1 487.49 C .20	A 418.48 D 106.13 G2 567.88 A .17	C 468.48 C 109.18 C 577.65 D .16	B 568.48 A 128.34 D 699.60 E .10	E 578.48 G4S 140.88 E 719.48 G4S .10	D 593.48 E 141.00 B 724.44 G2 .09	G4S 618.48 B 155.97 G4S 774.35 B .08	THRIE 718.48 G2 164.41 THRIE 794.51 G4W .07	G3 1318.48 G1 209.01 G3 1421.58 G1 -.03
4	STATE COST VALUES SOCIETAL COST VALUES TOTAL COST VALUES BENEFIT/COST VALUES	G1 278.48 THRIE 72.79 G1 487.51 C .21	A 418.48 D 102.05 G2 564.86 A .18	C 468.48 C 104.11 C 572.59 D .17	B 568.48 A 126.44 D 695.53 E .11	E 578.48 G4S 137.84 E 716.64 G4S .10	D 593.48 E 138.17 B 721.38 G2 .10	G4S 618.48 B 152.90 G4S 771.52 B .08	THRIE 718.48 G2 161.38 THRIE 791.27 G3 .08	G3 1318.48 G1 209.03 G3 1417.72 G1 -.03
2	STATE COST VALUES SOCIETAL COST VALUES TOTAL COST VALUES BENEFIT/COST VALUES	G1 278.48 THRIE 69.46 G1 487.53 C .22	A 418.48 D 97.55 G2 561.22 A .18	C 468.48 C 98.50 C 566.97 D .17	B 568.48 A 124.03 D 691.03 E .11	E 578.48 G4S 134.36 E 713.44 G4S .11	D 593.48 E 134.97 B 717.70 G2 .11	G4S 618.48 B 149.23 G4S 752.84 B .09	THRIE 718.48 G2 157.75 THRIE 787.93 G3 .08	G3 1318.48 G1 209.05 G3 1413.32 G1 -.03

A.326

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 12-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 200.87

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA												
DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11	
0	STATE COST VALUES SOCIETAL COST VALUES TOTAL COST VALUES BENEFIT/COST VALUES	G1 278.48 THRIE 65.96 G1 487.56 C .23	G2 403.48 G3 89.73 A 539.40 A .19	A 418.48 C 42.22 G2 556.77 THRIE .19	C 468.48 D 92.53 C 560.69 D .18	B 568.48 A 120.93 D 686.00 E .12	E 578.48 G4S 130.28 E 709.73 G2 .12	D 593.48 E 131.26 B 713.24 G4S .11	G4W 618.48 B 144.77 G4S 748.75 B .10	G4S 618.48 G4W 144.91 G4W 763.39 G4W .09	THRIE 718.48 G2 153.30 THRIE 784.44 G3 .08	G3 1318.48 G1 209.08 G3 1408.21 G1 -03
-2	STATE COST VALUES SOCIETAL COST VALUES TOTAL COST VALUES BENEFIT/COST VALUES	G1 278.48 THRIE 62.22 G1 487.60 C .25	G2 403.48 G3 83.71 A 535.36 A .20	A 418.48 C 85.12 G2 551.25 THRIE .19	C 468.48 D 86.81 C 553.59 D .19	B 568.48 A 116.89 D 680.28 G2 .13	E 578.48 G4S 125.37 E 705.33 E .13	D 593.48 E 126.86 B 707.76 G4S .12	G4W 618.48 B 139.29 G4S 743.25 B .11	G4S 618.48 G4W 139.43 G4W 752.91 G4W .10	THRIE 718.48 G2 147.77 THRIE 780.70 G3 .09	G3 1318.48 G1 209.12 G3 1402.14 G1 -03
-4	STATE COST VALUES SOCIETAL COST VALUES TOTAL COST VALUES BENEFIT/COST VALUES	G1 278.48 THRIE 53.16 G1 487.64 C .26	G2 403.48 G3 76.57 A 530.11 A .21	A 418.48 C 77.01 G2 544.34 D .20	C 468.48 D 80.22 C 545.49 THRIE .20	B 568.48 A 111.63 D 673.70 G2 .15	E 578.48 G4S 114.39 E 700.03 E .14	D 593.48 E 121.56 B 700.99 G4S .13	G4W 618.48 B 132.52 G4S 737.87 B .12	G4S 618.48 G4W 132.66 G4W 751.13 G4W .11	THRIE 718.48 G2 140.86 THRIE 776.64 G3 .09	G3 1318.48 G1 209.17 G3 1345.04 G1 -03
-6	STATE COST VALUES SOCIETAL COST VALUES TOTAL COST VALUES BENEFIT/COST VALUES	G1 278.48 THRIE 53.74 G1 487.70 C .28	G2 403.48 C 67.85 A 523.45 A .23	A 418.48 G3 68.19 G2 535.86 D .22	C 468.48 D 72.71 C 536.32 THRIE .20	B 568.48 A 104.98 D 666.18 G2 .17	E 578.48 G4S 112.18 B 692.76 E .15	D 593.48 E 115.21 E 693.69 G4S .14	G4W 618.48 B 124.29 G4S 730.66 B .13	G4S 618.48 G4W 124.43 G4W 742.90 G4W .12	THRIE 718.48 G2 132.38 THRIE 772.22 G3 .10	G3 1318.48 G1 209.23 G3 1386.67 G1 -03
-8	STATE COST VALUES SOCIETAL COST VALUES TOTAL COST VALUES BENEFIT/COST VALUES	G1 278.48 THRIE 49.17 G1 487.77 C .30	G2 403.48 C 58.15 A 515.68 A .25	A 418.48 G3 59.10 G2 526.17 D .23	C 468.48 D 64.66 C 526.63 THRIE .21	B 568.48 A 97.21 D 658.13 G2 .19	E 578.48 G4S 104.01 B 683.42 E .16	D 593.48 E 108.02 E 686.50 G4S .16	G4W 618.48 B 114.95 G4S 722.48 B .15	G4S 618.48 G4W 115.08 G4W 733.56 G4W .14	THRIE 718.48 G2 122.70 THRIE 767.65 G3 .11	G3 1318.48 G1 209.24 G3 1377.57 G1 -03

A.327

A.327

D-12-2

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 12-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 174.68

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

E	1	2	3	4	5	6	7	8	9	10	11
	G1	G2	A	C	R	E	D	G4W	G4S	THRIE	G3
STATE COST											
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1218.48
SOCIETAL COST	D	G4S	A	THRIE	G3	G2	C	E	B	G4W	G1
VALUES	56.37	56.62	62.96	63.92	69.88	74.63	78.50	83.81	84.75	84.89	169.05
TOTAL COST	G1	G2	A	C	D	B	E	G4S	G4W	THRIE	G3
VALUES	467.52	478.10	481.44	546.48	649.85	653.22	662.29	675.10	703.37	782.39	1386.35
BENEFIT/COST	A	G2	C	D	G4S	B	E	THRIE	G4W	G3	G1
VALUES	.27	.25	.21	.20	.19	.16	.16	.15	.15	.08	-.05

8	STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 488.48	B 568.48	E 578.48	D 593.48	G4W 618.48	G4S 618.48	THRIE 718.48	G3 1318.48
	SOCIETAL COST VALUES	D 55.25	G4S 55.34	A 61.65	THRIE 62.71	G3 68.49	G2 71.13	C 76.04	E 79.50	B 82.41	G4W 82.41	G1 168.63
	TOTAL COST VALUES	G1 467.10	G2 474.60	A 480.13	C 544.51	D 648.73	B 650.88	E 657.98	G4S 673.82	G4W 701.03	THRIE 781.19	G3 1386.97
	BENEFIT/COST VALUES	A .27	G2 .26	C .21	D .20	G4S .19	B .16	E .16	THRIE .15	G4W .15	G3 .08	G1 -.05

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6	STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 488.48	B 568.48	E 578.48	D 593.48	G4W 618.48	G4S 618.48	THRIE 718.48	G3 1318.48
	SOCIETAL COST VALUES	D 54.22	G4S 54.32	A 60.38	THRIE 61.55	G3 67.17	G2 67.40	C 73.56	E 75.29	B 80.09	G4W 80.24	G1 168.17
	TOTAL COST VALUES	G1 466.65	G2 470.88	A 478.86	C 542.04	D 647.80	B 648.57	E 653.76	G4S 672.70	G4W 698.71	THRIE 780.02	G3 1385.64
	BENEFIT/COST VALUES	A .27	G2 .27	C .22	D .20	G4S .19	B .17	E .17	THRIE .16	G4W .15	G3 .08	G1 -.05

4	STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 488.48	B 568.48	E 578.48	D 593.48	G4W 618.48	G4S 618.48	THRIE 718.48	G3 1318.48
	SOCIETAL COST VALUES	D 53.25	G4S 53.57	A 59.10	THRIE 60.38	G3 63.42	G2 65.85	C 71.05	E 71.21	B 77.77	G4W 77.92	G1 187.67
	TOTAL COST VALUES	G1 466.15	G2 466.89	A 477.58	C 539.52	D 646.25	B 647.05	E 649.69	G4S 671.72	G4W 696.39	THRIE 778.86	G3 1384.33
	BENEFIT/COST VALUES	A .28	G2 .28	C .22	D .20	G4S .20	B .18	E .17	THRIE .16	G4W .16	G3 .08	G1 -.05

2	STATE COST VALUES	G1 278.48	G2 403.48	A 418.48	C 488.48	B 568.48	E 578.48	D 593.48	G4W 618.48	G4S 618.48	THRIE 718.48	G3 1318.48
	SOCIETAL COST VALUES	D 52.37	G4S 52.97	A 57.75	THRIE 59.11	G3 59.13	G2 64.46	C 67.32	E 68.44	B 75.41	G4W 75.55	G1 187.12
	TOTAL COST VALUES	G1 462.59	G2 465.60	A 476.22	C 538.92	D 643.89	B 645.80	E 646.44	G4S 670.84	G4W 694.03	THRIE 777.61	G3 1382.93
	BENEFIT/COST VALUES	G2 -.29	A .28	C .23	D .21	G4S .20	B .19	E .17	THRIE .16	G4W .16	G3 .08	G1 -.04

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 12-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 174.68

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G4S	D	G2	A	THRIE	G3	E	C	B	G4W	G1
VALUES	51.49	52.45	54.38	56.19	57.68	62.87	63.63	65.67	72.92	73.06	185.51
TOTAL COST	G2	G1	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	457.86	464.99	474.67	534.14	641.40	642.11	645.92	669.97	691.54	776.16	1379.39
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THRIE	G3	G1
VALUES	.30	.28	.23	.21	.20	.19	.18	.16	.16	.08	-.04
-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	A	THRIE	E	G3	C	B	G4W	G1
VALUES	49.09	50.53	51.93	54.29	55.88	60.18	60.92	62.60	70.20	70.34	185.83
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	452.56	464.30	472.76	531.07	638.66	638.68	645.41	669.00	688.82	774.56	1379.39
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THRIE	G3	G1
VALUES	.31	.29	.24	.21	.20	.20	.18	.17	.17	.09	-.04
-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	A	THRIE	E	G3	C	B	G4W	G1
VALUES	49.08	49.36	51.35	51.89	53.57	57.00	58.44	59.12	67.14	67.28	185.05
TOTAL COST	G2	G1	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	446.56	463.53	470.36	527.59	635.47	635.62	644.83	667.84	685.76	772.05	1376.92
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G3	G1
VALUES	.33	.29	.25	.21	.20	.20	.19	.17	.17	.09	-.04
-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	A	D	THRIE	E	C	G3	B	G4W	G1
VALUES	36.32	47.93	48.89	50.65	50.65	54.13	55.17	55.35	63.69	63.83	187.16
TOTAL COST	G2	G1	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	439.79	462.64	467.37	523.65	632.17	632.61	644.13	666.40	682.31	769.13	1373.82
BENEFIT/COST	G2	A	C	D	E	G4S	B	G4W	THRIE	G3	G1
VALUES	.34	.30	.26	.21	.21	.20	.20	.18	.17	.09	-.03
-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	A	G4S	THRIE	D	C	E	G3	B	G4W	G1
VALUES	29.22	45.46	46.26	47.28	49.82	50.94	51.63	51.79	60.01	60.15	183.12
TOTAL COST	G2	G1	A	C	B	E	D	G4S	G4W	THRIE	G3
VALUES	432.69	461.59	463.93	519.41	628.49	630.11	643.29	664.74	678.62	765.76	1370.27
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G3	G1
VALUES	.36	.31	.26	.21	.21	.21	.20	.19	.18	.09	-.03

D-12-6

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 12-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 18 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 152.56

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	D	G4S	THRIE	A	F	G3	C	B	G4W	G1
VALUES	27.90	56.70	57.00	62.08	64.59	66.38	69.88	76.75	82.85	82.99	130.87
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	409.35	431.38	483.06	545.23	644.86	650.17	651.32	675.48	701.47	780.56	1388.35
BENEFIT/COST	G2	A	C	D	G4S	E	THRIE	B	G4W	G1	G3
VALUES	.31	.21	.16	.16	.15	.15	.13	.12	.11	.08	.06
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	D	G4S	THRIE	A	E	G3	C	B	G4W	G1
VALUES	26.50	55.47	55.59	61.52	62.71	63.87	68.44	74.90	81.18	81.32	130.32
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	408.79	429.97	481.19	543.38	645.34	648.94	649.65	674.07	699.80	779.99	1386.97
BENEFIT/COST	G2	A	C	D	G4S	E	THRIE	B	G4W	G1	G3
VALUES	.31	.21	.17	.16	.16	.15	.13	.13	.12	.08	.06
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	A	E	G3	C	B	G4W	G1
VALUES	25.28	54.37	54.45	60.85	61.00	61.54	67.17	72.90	79.37	78.52	129.66
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	408.14	428.76	479.48	541.37	640.02	647.85	647.92	672.84	697.99	779.33	1385.64
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G1	G3
VALUES	.32	.22	.17	.17	.16	.16	.13	.13	.12	.08	.06
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	A	E	THRIE	G3	C	B	G4W	G1
VALUES	24.26	53.32	53.63	59.42	59.42	60.03	65.85	70.71	77.41	77.55	128.87
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	407.34	427.74	477.89	539.19	637.40	645.88	647.11	671.80	695.03	778.50	1384.33
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1	G3
VALUES	.32	.22	.17	.17	.16	.16	.13	.13	.12	.09	.07
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	E	A	THRIE	G3	C	B	G4W	G1
VALUES	23.42	52.39	52.99	57.50	57.88	58.98	64.46	68.30	75.25	75.40	127.88
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	406.36	426.89	476.35	536.78	635.98	643.73	646.47	670.87	693.87	777.46	1382.93
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1	G3
VALUES	.32	.23	.18	.17	.16	.16	.14	.13	.12	.09	.07

A.330

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 12-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 18 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 152.56

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

0	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	E	A	THRIE	G3	C	G4W	G1
	VALUES	22.71	51.50	52.45	55.76	56.23	57.64	62.87	65.62	73.01	126.64
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	405.12	426.19	474.71	534.10	634.24	641.34	645.93	659.98	791.49	1381.34
	BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G1	G3
	VALUES	.32	.23	.14	.17	.17	.12	.10	.13	.09	.07

-2	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	E	A	THRIE	G3	C	G4W	G1
	VALUES	22.10	50.53	51.93	54.15	54.30	55.87	60.92	62.59	70.19	125.06
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	403.54	425.58	472.77	531.07	632.62	638.66	645.41	664.00	774.35	1379.34
	BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1	G3
	VALUES	.32	.23	.19	.17	.17	.16	.14	.13	.10	.07

-4	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	E	A	THRIE	G3	C	G4W	G1
	VALUES	21.54	49.36	51.35	51.89	52.63	53.57	58.44	59.12	67.14	123.03
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	401.51	425.02	470.36	527.59	631.11	635.62	644.83	667.84	782.05	1376.92
	BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1	G3
	VALUES	.32	.24	.20	.17	.17	.15	.14	.11	.07	.07

-6	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	E	A	THRIE	G3	C	G4W	G1
	VALUES	21.02	47.93	48.89	50.65	50.65	51.19	55.17	55.35	63.69	120.46
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	398.93	424.50	467.37	523.65	624.67	632.17	644.13	666.40	782.31	1373.82
	BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1	G3
	VALUES	.33	.25	.21	.18	.17	.17	.16	.14	.12	.07

-8	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	718.48	1318.48
	SOCIETAL COST	G2	G4S	D	E	A	THRIE	G3	C	G4W	G1
	VALUES	20.54	45.46	46.26	47.28	49.82	49.83	50.44	51.79	60.01	117.33
	TOTAL COST	G1	G2	A	C	E	B	D	G4S	THRIE	G3
	VALUES	395.80	424.02	463.93	519.41	628.31	628.49	643.29	664.74	785.76	1370.27
	BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G1	G3
	VALUES	.33	.26	.22	.18	.17	.17	.16	.15	.13	.08

D-12-6

A.331

D-12-8

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 12-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 20 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 133.92
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	D	G4S	THRIE	A	E	G3	C	G1	B	G4W
VALUES	27.67	54.95	55.31	62.08	64.59	64.82	64.66	76.25	77.17	82.85	82.99
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	355.55	431.15	483.06	545.23	643.29	648.43	651.32	673.79	701.47	780.56	1386.13
BENEFIT/COST	G2	G1	A	D	G4S	C	E	THRIE	B	G4W	G3
VALUES	.26	.20	.17	.13	.13	.12	.12	.10	.09	.08	.05
8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	D	G4S	THRIE	A	E	G3	C	G1	B	G4W
VALUES	26.36	54.33	54.49	61.52	62.71	62.85	68.35	73.67	74.90	81.18	21.32
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	352.15	429.83	481.19	549.38	641.33	647.81	649.65	672.97	694.80	779.99	1386.83
BENEFIT/COST	G2	G1	A	D	G4S	C	E	THRIE	B	G4W	G3
VALUES	.27	.22	.17	.13	.13	.13	.12	.10	.09	.09	.05
6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	G1	C	B	G4W
VALUES	25.20	53.73	53.78	60.85	60.45	61.00	62.04	64.97	72.90	74.37	79.54
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	349.44	428.68	479.48	541.37	639.42	647.26	647.85	672.20	697.94	779.33	1385.54
BENEFIT/COST	G2	G1	A	D	G4S	C	E	THRIE	B	G4W	G3
VALUES	.27	.23	.17	.14	.13	.13	.13	.10	.10	.09	.05
4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	G1	C	B	G4W
VALUES	24.22	52.99	53.30	59.12	59.42	60.03	65.81	66.01	70.71	77.41	77.55
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	344.49	427.69	477.89	539.19	637.59	645.88	646.77	671.47	696.03	778.50	1384.28
BENEFIT/COST	G2	G1	A	D	G4S	C	E	THRIE	B	G4W	G3
VALUES	.27	.24	.18	.14	.13	.13	.13	.10	.10	.09	.05
2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G4S	D	THRIE	E	A	G3	G1	C	B	G4W
VALUES	23.40	52.26	52.85	57.38	57.88	58.98	61.75	64.44	68.30	75.25	75.40
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	340.23	426.87	476.35	536.78	635.85	643.73	646.33	670.73	693.87	777.46	1382.91
BENEFIT/COST	G2	G1	A	D	G4S	C	E	THRIE	B	G4W	G3
VALUES	.27	.26	.18	.14	.14	.14	.13	.10	.10	.09	.05

A.332

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 12-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 20 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 133.92

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1	2	3	4	5	6	7	8	9	10	11
0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S
278.48	VALUES	418.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48
22.70	SOCIETAL COST	G1	G4S	D	E	A	G1	THRIE	G3	C
22.70	VALUES	51.46	51.46	52.41	55.72	56.23	57.08	57.64	62.85	65.62
335.56	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W
335.56	VALUES	426.18	426.18	474.71	534.10	634.20	641.34	645.88	669.93	691.49
.28	BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE
.28	VALUES	.19	.28	.19	.15	.14	.14	.13	.11	.11

-2	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S
278.48	VALUES	418.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48
22.10	SOCIETAL COST	G1	G4S	D	E	A	THRIE	THRIE	G3	C
22.10	VALUES	51.86	51.86	51.92	51.92	54.14	54.30	55.87	60.91	62.59
330.33	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W
330.33	VALUES	425.57	425.57	472.77	531.07	632.61	638.66	645.40	668.99	688.80
.29	BENEFIT/COST	G1	G2	A	C	D	E	G4S	B	THRIE
.29	VALUES	.19	.28	.19	.15	.14	.14	.13	.11	.11

-4	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S
278.48	VALUES	418.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48
21.54	SOCIETAL COST	G1	G4S	D	E	A	THRIE	THRIE	G3	C
21.54	VALUES	49.36	49.36	51.35	51.35	51.89	52.63	53.57	58.44	59.12
324.41	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W
324.41	VALUES	425.02	425.02	470.36	527.59	631.10	635.62	644.83	667.84	685.76
.32	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE
.32	VALUES	.20	.28	.20	.16	.14	.14	.14	.12	.11

-6	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S
278.48	VALUES	418.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48
21.02	SOCIETAL COST	G1	G4S	D	E	A	THRIE	E	C	G3
21.02	VALUES	47.93	47.93	48.89	50.65	50.65	50.65	51.19	55.17	55.35
317.75	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W
317.75	VALUES	424.50	424.50	467.37	523.65	629.67	632.17	644.13	666.40	682.31
.34	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE
.34	VALUES	.20	.28	.20	.17	.14	.14	.14	.12	.12

-8	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S
278.48	VALUES	418.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48
20.54	SOCIETAL COST	G1	G4S	D	E	A	THRIE	E	C	G3
20.54	VALUES	45.46	45.46	46.26	46.26	47.28	49.82	49.83	50.44	51.79
310.77	TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W
310.77	VALUES	424.02	424.02	463.93	519.41	628.31	628.49	643.29	664.74	678.62
.36	BENEFIT/COST	G1	G2	A	C	E	D	G4S	B	THRIE
.36	VALUES	.21	.28	.21	.18	.15	.14	.14	.13	.12

A.333

D-12-8

D-12-10

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 12-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 22 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 118.24
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE 1 2 3 4 5 6 7 8 9 10 11

IN STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G1	D	G4S	THRIE	A	E	G3	C	B	G4W
VALUES	25.83	49.00	54.95	55.31	62.08	64.59	64.82	69.66	76.75	82.85	82.49
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	327.47	429.31	483.06	545.23	643.29	648.43	651.32	673.79	701.47	780.56	1386.13
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.25	.23	.13	.11	.10	.04	.09	.08	.06	.06	.04

R STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	D	G4S	THRIE	A	E	G3	C	B	G4W
VALUES	25.16	45.43	54.33	54.49	61.52	62.71	62.85	68.35	74.90	81.18	81.32
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	323.91	428.54	481.19	543.38	641.33	647.81	649.65	672.97	699.80	779.99	1366.83
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.26	.23	.13	.11	.10	.10	.09	.08	.07	.06	.04

A.334

6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	E	A	G3	C	B	G4W
VALUES	24.50	42.04	53.73	53.78	60.85	60.95	61.00	67.09	72.90	79.37	79.52
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	320.52	427.98	479.48	541.37	639.42	647.26	647.85	672.20	697.49	779.33	1385.56
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.27	.23	.14	.11	.10	.10	.10	.08	.07	.06	.04

4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	A	THRIE	G3	C	B	G4W
VALUES	23.86	38.87	52.99	53.30	59.12	59.42	60.03	65.81	70.71	77.41	77.55
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	317.34	427.34	477.89	539.19	637.59	645.88	646.77	671.47	696.03	778.50	1384.28
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.29	.23	.14	.11	.11	.10	.10	.08	.07	.07	.04

2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	THRIE	A	THRIE	G3	C	B	G4W
VALUES	23.25	35.93	52.26	52.85	57.38	57.88	58.48	64.44	68.30	75.25	75.40
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	314.41	426.72	476.35	536.78	635.85	643.73	646.33	670.73	693.87	777.46	1382.91
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.30	.24	.14	.11	.11	.11	.11	.08	.08	.07	.04

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 12-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 22 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 118.24

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	A	THRIE	G3	C	B	G4W
VALUES	22.66	33.25	51.46	52.41	55.72	56.23	57.64	62.86	65.62	72.87	73.01
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	311.73	426.13	474.71	534.10	634.20	641.34	645.88	664.93	691.49	776.11	1381.33
BENEFIT/COST	G1	G2	A	C	D	E	G4S	THRIE	B	G4W	G3
VALUES	.31	.24	.15	.11	.11	.11	.11	.08	.08	.07	.04
-2 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	A	THRIE	G3	C	B	G4W
VALUES	22.09	30.83	50.52	51.92	54.14	54.30	55.87	60.91	62.59	70.19	70.33
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	304.31	425.56	472.77	531.07	632.61	638.46	645.40	668.99	688.80	774.35	1379.39
BENEFIT/COST	G1	G2	A	C	D	E	G4S	THRIE	B	G4W	G3
VALUES	.31	.24	.15	.12	.11	.11	.11	.09	.08	.08	.04
-4 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	A	THRIE	G3	C	B	G4W
VALUES	21.54	28.68	49.36	51.35	51.89	52.63	53.57	58.44	59.12	67.14	67.28
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	307.16	425.02	470.36	527.59	631.10	635.62	644.83	667.84	685.76	772.05	1376.92
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.32	.24	.16	.13	.11	.11	.11	.09	.09	.08	.05
-6 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	A	D	THRIE	E	C	G3	B	G4W
VALUES	21.02	26.85	47.93	48.89	50.65	50.65	51.19	55.17	55.35	63.69	63.83
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	305.33	424.50	467.37	523.65	629.67	632.17	644.13	666.40	682.31	769.13	1373.82
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.33	.24	.17	.13	.12	.11	.11	.10	.09	.09	.05
-8 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	A	G4S	THRIE	D	E	C	G3	B	G4W
VALUES	20.54	25.38	45.46	46.26	47.28	49.82	49.83	50.94	51.79	60.01	60.15
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	303.86	424.02	463.93	519.41	628.31	628.49	643.29	664.74	678.62	765.76	1370.27
BENEFIT/COST	G1	G2	A	C	E	G4S	D	B	THRIE	G4W	G3
VALUES	.33	.24	.17	.14	.12	.12	.12	.10	.10	.09	.05

A.335

D-12-10

D-12-12

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 12-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 24 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 105.06

AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

10	1	2	3	4	5	6	7	8	9	10	11
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G2	D	G4S	THRIE	A	E	G3	C	B	G4W
VALUES	25.83	25.99	54.95	55.31	62.08	64.59	64.82	67.88	76.75	82.85	82.99
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	304.46	429.31	483.06	545.23	643.29	648.43	651.32	672.79	701.47	780.56	1386.34
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.28	.20	.10	.08	.08	.07	.06	.06	.04	.04	.03

8	1	2	3	4	5	6	7	8	9	10	11
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G2	D	G4S	THRIE	A	E	G3	C	B	G4W
VALUES	25.05	25.16	54.33	54.49	61.52	62.71	62.85	67.20	74.90	81.18	81.32
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	303.53	428.64	481.19	543.38	641.33	647.81	649.65	672.97	694.80	779.49	1385.68
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.29	.20	.10	.09	.08	.07	.06	.06	.04	.04	.03

6	1	2	3	4	5	6	7	8	9	10	11
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G2	D	G4S	THRIE	A	E	G3	C	B	G4W
VALUES	24.33	24.50	53.73	53.78	60.85	60.95	61.00	66.41	72.90	79.37	79.52
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	302.80	427.98	479.48	541.37	639.42	647.26	647.85	672.20	697.99	779.33	1384.89
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.29	.20	.11	.09	.08	.08	.07	.06	.05	.04	.03

4	1	2	3	4	5	6	7	8	9	10	11
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G2	D	G4S	THRIE	A	E	G3	C	B	G4W
VALUES	23.82	23.86	52.99	53.30	59.12	59.42	60.03	65.46	70.71	77.41	77.55
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	302.29	427.34	477.89	539.19	637.59	645.88	646.77	671.47	696.03	778.50	1383.94
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.29	.20	.11	.09	.08	.08	.07	.06	.05	.04	.03

2	1	2	3	4	5	6	7	8	9	10	11
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G1	G2	D	G4S	THRIE	A	E	G3	C	B	G4W
VALUES	24.25	24.50	52.26	52.85	57.38	57.88	58.98	64.29	68.30	75.25	75.40
TOTAL COST	G1	G2	A	C	E	D	B	G4S	G4W	THRIE	G3
VALUES	301.97	426.72	476.35	536.78	635.85	643.73	646.33	670.73	693.87	777.46	1382.77
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.29	.20	.11	.09	.09	.08	.08	.06	.05	.05	.03

A.336

SUMMARY OF RESULTS

ALL DIVIDED HIGHWAYS W/ 12-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 24 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 105.06
 AADT = 1000 GUARDRAIL LENGTH = 100 FT OBSTACLE LENGTH = 100 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

	1	2	3	4	5	6	7	8	9	10	11
0											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	A	THRIE	G3	C	B	G4W
VALUES	22.66	23.32	51.46	52.41	55.72	56.23	57.64	62.81	65.62	72.87	73.01
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	301.80	426.13	474.71	534.10	634.20	641.34	645.88	669.43	691.49	776.11	1361.29
BENEFIT/COST	G1	G2	A	D	G4S	E	C	THRIE	B	G4W	G3
VALUES	.29	.20	.12	.09	.09	.04	.08	.07	.06	.05	.03
-2											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	E	A	THRIE	G3	C	B	G4W
VALUES	22.09	23.24	50.52	51.92	54.14	54.30	55.87	60.91	62.59	70.19	70.33
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	301.71	426.56	472.77	531.07	632.61	638.66	645.40	668.99	685.80	774.35	1379.38
BENEFIT/COST	G1	G2	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	.29	.21	.12	.09	.09	.09	.09	.07	.06	.06	.03
-4											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.49	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	D	A	E	THRIE	G3	C	B	G4W
VALUES	21.54	23.19	49.36	51.35	51.89	52.63	53.57	58.44	59.12	67.14	67.28
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	301.67	425.02	470.36	527.59	631.10	635.62	644.83	667.84	685.76	772.05	1376.92
BENEFIT/COST	G1	G2	A	C	E	D	G4S	THRIE	B	G4W	G3
VALUES	.29	.21	.13	.10	.09	.09	.09	.07	.07	.06	.04
-6											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	G4S	A	D	THRIE	E	C	G3	B	G4W
VALUES	21.02	23.16	47.93	48.89	50.65	50.65	51.19	55.17	55.35	63.69	62.83
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	301.63	424.50	467.37	523.65	629.67	632.17	644.13	666.40	682.31	769.13	1373.82
BENEFIT/COST	G1	G2	A	C	E	E	D	THRIE	B	G4W	G3
VALUES	.29	.21	.13	.11	.09	.09	.09	.08	.07	.07	.04
-8											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	278.48	403.48	418.48	468.48	568.48	578.48	593.48	618.48	618.48	718.48	1318.48
SOCIETAL COST	G2	G1	A	G4S	THRIE	D	E	C	G3	B	G4W
VALUES	20.54	23.12	45.46	46.26	47.28	49.82	49.83	50.94	51.79	60.01	60.15
TOTAL COST	G1	G2	A	C	E	B	D	G4S	G4W	THRIE	G3
VALUES	301.60	424.02	463.93	519.41	628.31	628.49	643.29	664.74	678.62	765.76	1370.27
BENEFIT/COST	G1	G2	A	C	E	E	D	THRIE	B	G4W	G3
VALUES	.29	.21	.14	.12	.10	.10	.09	.08	.08	.07	.04

D-12-12

APPENDIX B
GUARDRAIL PLACEMENT CASE OUTPUTS

SUMMARY OF RESULTS

EXAMPLE GUARDRAIL PLACEMENT CASE - 12-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 3 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 15 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 3561.28

AADT = 5000 GUARDRAIL LENGTH = 222 FT OBSTACLE LENGTH = 200 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	GW	G4S	THRIE	G3
VALUES	618.22	895.72	929.02	1040.02	1262.02	1284.22	1317.52	1373.02	1373.02	1595.02	2927.02
SOCIETAL COST	THRIE	C	D	A	G3	B	GW	E	G4S	G2	G1
VALUES	1243.43	1535.58	1584.84	1669.31	1692.32	1880.76	1883.83	1928.30	1942.43	2938.45	4295.65
TOTAL COST	C	A	THRIE	D	B	E	GW	G4S	G2	G3	G1
VALUES	2575.60	2598.33	2838.44	2902.36	3142.77	3212.51	3256.84	3315.44	3834.67	4619.34	4913.87
BENEFIT/COST	A	C	D	THRIE	B	E	GW	G4S	G2	G3	G1
VALUES	2.04	1.95	1.50	1.45	1.33	1.27	1.22	1.18	.69	.64	-1.19

B.2

SUMMARY OF RESULTS

EXAMPLE GUARDRAIL PLACEMENT CASE - 11-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 11 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 15 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 3561.28

AADT = 5000 GUARDRAIL LENGTH = 230 FT OBSTACLE LENGTH = 200 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	640.49	927.49	962.49	1077.49	1307.49	1330.49	1364.49	1422.49	1422.49	1652.49	3032.49
SOCIETAL COST	G4S	D	A	THRIE	G2	G3	C	E	B	G4W	G1
VALUES	1223.27	1238.34	1330.04	1343.55	1428.75	1442.34	1610.66	1701.43	1782.06	1745.44	4317.16
TOTAL COST	A	G2	D	G4S	C	THRIE	E	B	G4W	G3	G1
VALUES	2242.54	2356.74	2603.33	2645.76	2688.16	2946.05	3031.92	3099.55	3217.93	4524.84	4957.65
BENEFIT/COST	A	G2	C	D	G4S	E	B	THRIE	G4W	G3	G1
VALUES	2.32	2.30	1.81	1.70	1.64	1.40	1.35	1.34	1.24	.68	-1.18

B.3

SUMMARY OF RESULTS

EXAMPLE GUARDRAIL PLACEMENT CASE - 10-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 5 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 15 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 3561.28

AADT = 5000 GUARDRAIL LENGTH = 238 FT OBSTACLE LENGTH = 200 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	662.77	960.27	995.97	1114.97	1352.97	1376.77	1412.47	1471.97	1471.97	1709.47	3137.97
SOCIETAL COST	G4S	D	THRIE	A	E	G2	G3	C	B	G4W	G1
VALUES	1302.41	1325.36	1422.86	1425.99	1472.53	1478.77	1601.43	1711.18	1893.91	1897.62	3643.70
TOTAL COST	A	G2	D	G4S	C	E	THRIE	B	G4W	G1	G3
VALUES	2421.96	2439.05	2737.83	2774.39	2826.15	2849.40	3132.83	3246.89	3369.59	4306.48	4739.41
BENEFIT/COST	G2	A	C	D	G4S	E	THRIE	B	G4W	G3	G1
VALUES	2.17	2.14	1.66	1.58	1.53	1.52	1.25	1.23	1.13	.62	-.12

B.4

SUMMARY OF RESULTS

EXAMPLE GUARDRAIL PLACEMENT CASE - 9-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 9 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 15 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 3561.28
 AADT = 5000 GUARDRAIL LENGTH = 247 FT OBSTACLE LENGTH = 200 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	687.84	996.59	1033.64	1157.14	1404.14	1428.84	1465.89	1527.64	1527.64	1774.64	3256.64
SOCIETAL COST	G2	G4S	D	THRIE	A	E	G3	C	B	G4W	G1
VALUES	626.72	1401.95	1435.83	1531.54	1546.15	1573.39	1716.57	1798.29	2008.45	2012.52	3505.23
TOTAL COST	G2	A	D	G4S	C	E	THRIE	B	G4W	G1	G3
VALUES	1623.30	2579.79	2901.72	2929.58	2955.92	3002.22	3306.17	3412.58	3540.16	4193.07	4973.21
BENEFIT/COST	G2	A	C	D	G4S	E	THRIE	B	G4W	G3	G1
VALUES	2.94	1.95	1.52	1.45	1.41	1.39	1.14	1.11	1.01	.57	.08

SUMMARY OF RESULTS

EXAMPLE GUARDRAIL PLACEMENT CASE - 8-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 7 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 15 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 3561.28

AADT = 5000 GUARDRAIL LENGTH = 256 FT OBSTACLE LENGTH = 200 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0	STATE COST	G1	G2	A	C	B	D	G4W	G4S	THRIE	G3
	VALUES	712.40	1032.90	1071.30	1199.30	1455.30	1480.90	1519.30	1583.30	1839.30	3375.30
	SOCIETAL COST	G2	G4S	D	THRIE	A	E	G3	B	G4W	G1
	VALUES	667.38	1483.47	1531.06	1634.85	1644.65	1661.54	1826.96	1901.89	2142.90	2147.36
	TOTAL COST	G2	A	D	G4S	C	E	THRIE	B	G1	G3
	VALUES	1700.28	2715.95	3050.36	3066.77	3101.19	3142.44	3474.14	3598.20	3730.66	4087.75
	BENEFIT/COST	G2	A	C	D	G4S	E	THRIE	B	G3	G1
	VALUES	2.80	1.79	1.38	1.34	1.31	1.28	1.05	.97	.89	.51
											.26

B.6

SUMMARY OF RESULTS

EXAMPLE GUARDRAIL PLACEMENT CASE - 7-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 15 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 3501.28

AADT = 5000 GUARDRAIL LENGTH = 266 FT OBSTACLE LENGTH = 200 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	740.75	1073.25	1113.15	1246.15	1512.15	1538.75	1578.65	1645.15	1645.15	1911.15	3507.15
SOCIETAL COST	G2	G4S	D	G1	THRIE	A	E	G3	C	B	G4W
VALUES	703.64	1582.64	1648.44	1706.04	1733.66	1744.27	1772.56	1924.61	2003.05	2280.81	2285.64
TOTAL COST	G2	G1	A	D	G4S	C	E	THRIE	B	G4W	G3
VALUES	1776.44	2446.84	2857.42	3227.58	3227.83	3245.14	3311.31	3644.81	3782.95	3930.84	5431.75
BENEFIT/COST	G2	G1	A	C	D	G4S	E	THRIE	B	G4W	G3
VALUES	2.66	2.50	1.53	1.25	1.21	1.20	1.16	.96	.85	.78	.47

B.7

SUMMARY OF RESULTS

EXAMPLE GUARDRAIL PLACEMENT CASE - 6-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 9 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 15 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 3561.28
 AADT = 5000 GUARDRAIL LENGTH = 276 FT OBSTACLE LENGTH = 200 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	768.59	1113.59	1154.99	1292.99	1568.99	1596.59	1637.99	1706.99	1706.99	1982.99	3638.99
SOCIETAL COST	G2	G4S	G1	D	THRIE	A	E	G3	C	B	G4W
VALUES	754.82	1669.59	1740.45	1759.36	1815.26	1834.07	1877.61	2017.82	2087.30	2407.57	2412.90
TOTAL COST	G2	G1	A	G4S	C	D	E	THRIE	B	G4W	G3
VALUES	1868.42	2509.05	2989.06	3376.59	3380.29	3397.35	3474.21	3798.26	3976.57	4119.89	5656.81
BENEFIT/COST	G2	G1	A	C	G4S	D	E	THRIE	B	G4W	G3
VALUES	2.52	2.37	1.50	1.14	1.11	1.10	1.05	.88	.74	.67	.42

B.8

SUMMARY OF RESULTS

EXAMPLE GUARDRAIL PLACEMENT CASE - 5-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 10 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 15 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 3561.28

AADT = 5000 GUARDRAIL LENGTH = 287 FT OBSTACLE LENGTH = 200 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	799.23	1157.48	1201.03	1344.53	1631.53	1660.23	1703.28	1775.03	1775.03	2062.03	3784.03
SOCIETAL COST	G2	G1	G4S	D	THRIE	A	E	G3	C	B	G4W
VALUES	799.39	1146.29	1743.65	1862.48	1880.61	1915.57	1975.91	2095.55	2154.68	2524.93	2530.71
TOTAL COST	G2	G1	A	C	G4S	D	E	THRIE	B	G4W	G3
VALUES	1957.36	1995.51	3116.60	3499.21	3518.68	3565.76	3636.14	3942.64	4156.45	4305.73	5879.58
BENEFIT/COST	G1	G2	A	C	G4S	D	E	THRIE	B	G4W	G3
VALUES	2.96	2.39	1.37	1.05	1.02	1.00	.95	.82	.64	.58	.39

B.9

SUMMARY OF RESULTS

EXAMPLE GUARDRAIL PLACEMENT CASE - 4-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 11 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 15 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 3561.28

AADT = 5000 GUARDRAIL LENGTH = 299 FT OBSTACLE LENGTH = 200 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1	2	3	4	5	6	7	8	9	10	11
0	STATE COST	G1	G2	A	C	E	D	G4S	THRIE	G3
	VALUES	832.64	1206.39	1251.24	1400.74	1698.74	1729.64	1849.24	2148.24	3942.24
	SOCIETAL COST	G2	G1	G4S	THRIE	D	E	C	B	G4W
	VALUES	856.62	928.18	1799.91	1928.02	1953.06	1984.96	2059.91	2628.75	2635.01
	TOTAL COST	G1	G2	A	C	G4S	D	THRIE	B	G3
	VALUES	1760.82	2063.01	3236.20	3601.62	3649.15	3727.55	3789.55	4484.26	6098.12
	BENEFIT/COST	G1	G2	A	C	G4S	D	THRIE	B	G3
	VALUES	3.16	2.24	1.26	.97	.95	.91	.87	.50	.36

B.10

SUMMARY OF RESULTS

EXAMPLE GUARDRAIL PLACEMENT CASE - 3-FT SHOULDER

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 12 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 15 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 3561.28
 AADT = 5000 GUARDRAIL LENGTH = 311 FT OBSTACLE LENGTH = 200 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

1	2	3	4	5	6	7	8	9	10	11
0	STATE COST	G1	G2	A	C	E	D	G4S	THRIE	G3
	VALUES	866.06	1254.81	1301.46	1456.96	1767.96	1845.71	1923.46	2234.46	4100.46
	SOCIETAL COST	G2	G1	G4S	THRIE	D	E	C	B	G4W
	VALUES	909.51	1002.07	1832.83	1957.36	2023.60	2035.98	2119.37	2222.83	2713.84
	TOTAL COST	G1	G2	A	C	G4S	D	THRIE	B	G3
	VALUES	1868.13	2164.32	3337.44	3679.79	3756.29	3869.31	4191.82	4644.05	6293.40
	BENEFIT/COST	G1	G2	A	C	G4S	D	THRIE	B	G3
	VALUES	2.96	2.11	1.17	.92	.90	.80	.72	.48	.44
										.33

B.11

APPENDIX C
PRIORITY RANKING CASE OUTPUTS

CASE I

CASE 1. 2-LANE RURAL ROAD

SUMMARY OF RESULTS

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 5 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 14211.63
 AADT = 5000 GUARDRAIL LENGTH = 500 FT OBSTACLE LENGTH = 400 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
STATE COST VALUES	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
SOCIETAL COST VALUES	1392.38	2017.38	2092.38	2342.38	2842.38	2892.38	2867.38	3092.38	3092.38	3592.38	6592.38
TOTAL COST VALUES	3579.73	4575.85	4612.12	4848.33	6515.10	6769.08	7066.69	7205.47	7837.08	7847.95	18420.94
BENEFIT/COST VALUES	6954.50	7172.11	7815.71	8607.48	9222.85	9861.46	9959.07	10679.46	10940.33	11168.23	19813.32
	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1	G3
	4.10	3.68	3.47	3.16	2.96	2.47	2.41	2.24	2.06	1.46	-3.02

SUMMARY OF RESULTS

CASE 2. 2-LANE RURAL ROAD

CASE 2

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 5 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 28994.64

AADT = 10000 GUARDRAIL LENGTH = 500 FT OBSTACLE LENGTH = 400 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	1392.38	2017.38	2092.38	2342.38	2842.38	2892.38	2867.38	3092.38	3092.38	3592.38	6592.38
SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	G2	G	G4W	G1
VALUES	7344.92	9337.16	9409.70	9882.12	13215.66	13723.62	14318.84	14596.40	15859.63	15881.35	37027.34
TOTAL COST	THRIE	C	D	A	G3	G2	G4S	E	B	G4W	G1
VALUES	10937.30	11752.08	12849.49	15308.04	15929.54	16613.78	16816.00	17211.22	18702.01	18973.73	38419.72
BENEFIT/COST	C	A	G2	D	THRIE	E	G4S	B	G4W	G3	G1
VALUES	8.36	7.54	7.14	6.44	6.03	5.07	4.94	4.62	4.24	2.98	-5.77

C.3

CASE 3

SUMMARY OF RESULTS CASE 3. 2-LANE RURAL ROAD

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 7 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 12307.28
 AADT = 5000 GUARDRAIL LENGTH = 500 FT OBSTACLE LENGTH = 400 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	1392.38	2017.38	2092.38	2342.38	2842.38	2892.38	2967.38	3092.38	3092.38	3592.38	6592.38
SOCIETAL COST	G2	G4S	THRIE	D	A	G3	C	E	B	G4W	G1
VALUES	2683.06	2954.59	3154.97	3261.75	3266.12	3536.59	3581.38	3817.97	4373.53	4384.39	13613.66
TOTAL COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G3	G1
VALUES	4700.44	5358.50	5923.76	6046.96	6229.13	6710.35	6747.35	7215.91	7476.77	10128.96	15006.04
BENEFIT/COST	G2	A	C	D	G4S	E	B	G4W	THRIE	G3	G1
VALUES	4.77	4.32	3.73	3.05	3.02	2.94	2.79	2.56	2.55	1.33	-0.94

C.4

SUMMARY OF RESULTS

CASE 4. 2-LANE RURAL ROAD

CASE 4

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 7 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 12307.28
 AADT = 5000 GUARDRAIL LENGTH = 500 FT OBSTACLE LENGTH = 400 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
10 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	1392.38	2017.38	2092.38	2342.38	2842.38	2892.38	2967.38	3092.38	3092.38	3592.38	6592.38
SOCIETAL COST	G4S	D	G2	THRIE	A	G3	C	E	B	G4W	G1
VALUES	3610.35	3797.60	3894.02	3952.54	4056.38	4407.94	4590.20	4780.53	5321.53	5339.13	14123.51
TOTAL COST	G2	A	G4S	D	C	THRIE	E	B	G4W	G3	G1
VALUES	5411.40	6148.76	6702.73	6764.98	6932.58	7544.92	7672.91	8163.91	8425.51	11000.31	15515.89
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3	G1
VALUES	4.17	3.94	3.29	2.87	2.81	2.60	2.46	2.33	2.26	1.20	-1.30

C.5

SUMMARY OF RESULTS

CASE 5. 2-LANE RURAL ROAD

CASE 5

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 7 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 12307.28

AADT = 5000 GUARDRAIL LENGTH = 500 FT OBSTACLE LENGTH = 400 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
-10	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	1392.38	2017.38	2092.38	2342.38	2842.38	2892.38	2967.38	3092.38	3592.38	6592.38
	SOCIETAL COST	G2	G4S	THRIE	A	C	G3	D	B	G4W	G1
	VALUES	1499.20	2378.45	2406.99	2513.86	2586.97	2733.84	2802.04	2877.28	3457.30	13022.01
	TOTAL COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G1
	VALUES	3516.58	4606.24	4929.35	5470.82	5769.42	5769.66	5999.37	6299.68	6559.71	14414.39
	BENEFIT/COST	G2	A	C	E	G4S	D	B	THRIE	G3	G1
	VALUES	5.36	4.68	4.15	3.26	3.21	3.20	3.11	2.86	2.76	1.45
											-5.51

C.6

SUMMARY OF RESULTS

CASE 6. 2-LANE RURAL ROAD

CASE 6

PAVEMENT-TO-GUARDRAIL DISTANCE = 3 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 5 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 9 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 10680.52

AADT = 5000 GUARDRAIL LENGTH = 500 FT OBSTACLE LENGTH = 400 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	1392.38	2017.38	2092.38	2392.38	2842.38	2892.38	2467.38	3092.38	3092.38	3592.38	6592.38
SOCIETAL COST	G2	G4S	THRIE	D	A	E	G3	C	B	G4W	G1
VALUES	1473.57	2954.09	3146.87	3261.07	3273.29	3414.25	3536.59	3573.69	4363.08	4373.94	8292.03
TOTAL COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G1	G3
VALUES	3490.95	5365.66	5916.07	6096.47	6228.45	6306.63	6739.25	7205.46	7466.32	9684.41	10128.96
BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G4W	G1	G3
VALUES	4.56	3.54	3.03	2.51	2.50	2.50	2.22	2.10	2.04	1.72	1.08

C.7

CASE 7

SUMMARY OF RESULTS

CASE 7. 2-LANE RURAL ROAD

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 10 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 9959.85

AADT = 5000 GUARDRAIL LENGTH = 500 FT OBSTACLE LENGTH = 400 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	1392.38	2017.38	2092.38	2342.38	2842.38	2842.38	2967.38	3092.38	3092.38	3592.38	6592.38
SOCIETAL COST	G2	G4S	THRIE	D	A	E	G3	C	B	G4W	G1
VALUES	1450.00	3020.83	3224.11	3277.33	3319.33	3454.84	3610.55	3680.39	4395.90	4406.38	8381.67
TOTAL COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G1	G3
VALUES	3467.38	5411.71	6022.77	6113.21	6244.71	6347.22	6816.49	7238.28	7498.76	9774.05	10202.93
BENEFIT/COST	G2	A	C	D	E	G4S	R	THRIE	G4W	G1	G3
VALUES	4.22	3.17	2.68	2.25	2.25	2.24	1.96	1.88	1.80	1.13	.96

C.8

CASE 8

CASE 8. 2-LANE RURAL ROAD

SUMMARY OF RESULTS

PAVEMENT-TO-GUARDRAIL DISTANCE = 5 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 11 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 9295.33
 AADT = 5000 GUARDRAIL LENGTH = 500 FT OBSTACLE LENGTH = 400 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0	STATE COST VALUES	G1 1392.38	G2 2017.38	A 2092.38	C 2342.38	B 2842.38	E 2967.38	D 3092.38	G4S 3092.38	THRIE 3592.38	G3 6592.38
	SOCIETAL COST VALUES	G2 1418.16	G4S 3052.94	D 3260.50	THRIE 3276.32	A 3337.24	E 3456.47	G3 3659.42	B 3753.80	G4W 4408.90	G1 8303.01
	TOTAL COST VALUES	G2 3435.53	A 5429.61	C 6096.18	G4S 6145.32	D 6227.88	E 6348.85	B 6868.70	THRIE 7241.21	G3 9695.39	G1 10251.80
	BENEFIT/COST VALUES	G2 3.90	A 2.85	C 2.37	D 2.03	E 2.02	G4S 2.02	B 1.72	THRIE 1.68	G3 1.58	G1 .71

CASE 9

SUMMARY OF RESULTS

CASE 9. 2-LANE RURAL ROAD

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 8683.02

AADT = 5000 GUARDRAIL LENGTH = 500 FT OBSTACLE LENGTH = 400 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	1392.38	2017.38	2092.38	2342.38	2842.38	2842.38	2967.38	3092.38	3092.38	3592.38	6592.38
SOCIETAL COST	G2	G4S	D	THRIE	A	E	G3	C	B	G4W	G1
VALUES	1380.73	3044.71	3208.06	3288.52	3322.59	3420.13	3668.33	3781.34	4361.55	4371.19	8095.55
TOTAL COST	G2	A	C	G4S	D	E	THRIE	B	G4W	G1	G3
VALUES	3398.11	5414.97	6123.72	6137.09	6175.44	6312.50	6880.90	7203.93	7463.57	9487.93	10260.71
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3	G1
VALUES	3.62	2.56	2.09	1.85	1.82	1.82	1.52	1.50	1.39	.76	.42

C.10

CASE 10

CASE 10. 2-LANE RURAL ROAD

SUMMARY OF RESULTS

PAVEMENT-TO-GUARDRAIL DISTANCE = 7 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 13 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 8119.13

AADT = 5000 GUARDRAIL LENGTH = 500 FT OBSTACLE LENGTH = 400 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0	STATE COST	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	1392.38	2017.38	2092.38	2342.38	2842.38	2967.38	3092.38	3092.38	3592.38	6592.38
	SOCIETAL COST	G2	G4S	D	THRIE	A	E	C	B	G4W	G1
	VALUES	1341.46	3000.42	3125.87	3258.77	3278.71	3355.51	3635.81	3765.12	4287.23	7803.30
	TOTAL COST	G2	A	G4S	D	C	E	THRIE	B	G4W	G1
	VALUES	3358.84	5371.09	6092.80	6093.25	6107.50	6247.89	6851.15	7129.61	7388.80	9195.68
	BENEFIT/COST	G2	A	C	D	G4S	E	THRIE	B	G4W	G1
	VALUES	3.36	2.31	1.86	1.68	1.66	1.65	1.35	1.24	.68	.23

C.11

CASE II

CASE 11. 2-LANE RURAL ROAD

SUMMARY OF RESULTS

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 7600.10

ADT = 5000 GUARDRAIL LENGTH = 500 FT OBSTACLE LENGTH = 400 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	1392.38	2017.38	2092.38	2342.38	2842.38	2842.38	2967.38	3092.38	3092.38	3592.38	6592.38
SOCIETAL COST	G2	G4S	D	THRIE	A	E	G3	C	B	G4W	G1
VALUES	1303.48	2928.55	3022.61	3193.06	3212.22	3274.11	3568.28	3714.62	4185.35	4194.06	7461.55
TOTAL COST	G2	A	D	G4S	C	E	THRIE	B	G4W	G1	G3
VALUES	3320.86	5304.59	5989.98	6020.93	6057.00	6166.49	6785.44	7027.72	7286.44	8853.93	10160.66
BENEFIT/COST	G2	A	C	D	G4S	E	THRIE	B	G4W	G3	G1
VALUES	3.12	2.10	1.66	1.54	1.51	1.50	1.23	1.20	1.10	.61	.10

SUMMARY OF RESULTS

CASE 12. 4-LANE RURAL ROAD

CASE 12

PAVEMENT-TO-GUARDRAIL DISTANCE = 4 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 8 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 8866.77

AADT = 10000 GUARDRAIL LENGTH = 500 FT OBSTACLE LENGTH = 400 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	1392.38	2017.38	2092.38	2342.38	2842.38	2892.38	2867.38	3092.38	3092.38	3592.38	6592.38
SOCIETAL COST	G2	G1	G4S	THRIE	D	C	E	A	G3	B	G4W
VALUES	1747.95	2901.59	3111.80	3168.13	3421.00	3474.26	3494.86	3509.20	3636.45	4208.50	4218.59
TOTAL COST	G2	G1	A	C	G4S	E	D	THRIE	B	G4W	G3
VALUES	3765.33	4293.97	5601.58	5816.64	6204.18	6387.24	6388.38	6760.51	7050.88	7310.97	10228.83
BENEFIT/COST	G1	G2	A	C	G4S	E	D	B	THRIE	G4W	G3
VALUES	4.28	3.53	2.56	2.30	1.86	1.86	1.84	1.64	1.59	1.50	.79

C.13

SUMMARY OF RESULTS

CASE 13. 4-LANE RURAL ROAD

CASE 13

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 8866.77

ADOT = 10000 GUARDRAIL LENGTH = 500 FT OBSTACLE LENGTH = 400 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0	STATE COST	G1	G2	A	C	B	E	D	G4S	THRIE	G3
	VALUES	1392.38	2017.38	2092.38	2342.38	2842.38	2892.38	2967.38	3092.38	3592.38	6592.38
	SOCIETAL COST	G2	G4S	THRIE	D	A	E	C	B	G4W	G1
	VALUES	1837.13	3329.07	3368.05	3533.86	3585.53	3586.53	3667.11	4013.64	4281.96	8080.58
	TOTAL COST	G2	A	C	G4S	E	D	THRIE	B	G1	G3
	VALUES	3854.51	5677.91	6009.49	6421.45	6478.91	6501.24	6460.43	7114.86	9472.96	10606.02
	BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G4W	G1
	VALUES	3.48	2.52	2.22	1.83	1.80	1.74	1.62	1.53	1.48	.74
											.56

CASE 14

SUMMARY OF RESULTS

CASE 14. 4-LANE RURAL ROAD

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 4 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 8866.77
 AADT = 10000 GUARDRAIL LENGTH = 500 FT OBSTACLE LENGTH = 400 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	1392.38	2017.38	2042.38	2342.38	2842.38	2842.38	2467.38	3042.38	3042.38	3542.38	6542.38
SOCIETAL COST	G2	A	G4S	THRIE	D	C	E	G3	B	G4W	G1
VALUES	2941.82	3396.90	3400.00	3457.01	3523.04	3774.13	3829.98	3964.83	4451.79	4460.47	11105.96
TOTAL COST	G2	A	C	D	G4S	E	THRIE	B	G4W	G3	G1
VALUES	4959.20	5489.28	6116.51	6480.42	6492.37	6722.36	7049.39	7294.17	7552.85	10557.21	12498.34
BENEFIT/COST	G2	A	C	D	G4S	E	B	THRIE	G4W	G3	G1
VALUES	2.94	2.61	2.17	1.80	1.77	1.74	1.55	1.51	1.42	.74	-1.61

CASE 15

SUMMARY OF RESULTS CASE 15. 4-LANE RURAL ROAD

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 2 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 8866.77
 AADT = 10000 GUARDRAIL LENGTH = 500 FT OBSTACLE LENGTH = 400 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	1392.38	2017.38	2092.38	2342.38	2842.38	2892.38	2967.38	3092.38	3092.38	3592.38	6592.38
SOCIETAL COST	THRIE	G3	C	D	A	G4S	E	B	G4W	G2	G1
VALUES	3799.75	4901.83	4908.38	5041.64	6469.82	6964.09	7038.58	7666.05	7673.86	8069.76	11439.17
TOTAL COST	C	THRIE	D	A	E	G4S	G2	B	G4W	G3	G1
VALUES	7250.76	7392.13	8009.02	8562.20	9930.96	10056.47	10087.14	10508.43	10766.24	11494.20	12831.55
BENEFIT/COST	C	THRIE	D	A	E	G4S	G3	B	G2	G4W	G1
VALUES	1.69	1.41	1.29	1.15	.63	.62	.60	.42	.40	.39	-1.85

SUMMARY OF RESULTS

CASE 1b. 4-LANE FREEWAY

CASE 16

PAVEMENT-TO-GUARDRAIL DISTANCE = 6 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 12 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 10731.02

AADT = 10000 GUARDRAIL LENGTH = 500 FT OBSTACLE LENGTH = 400 FT

DEGREE
OF CURVE

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA

	1	2	3	4	5	6	7	8	9	10	11
0											
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	1392.38	2017.38	2082.38	2342.38	2842.38	2842.38	2967.38	3042.38	3042.38	3592.38	6592.38
SOCIETAL COST	G2	G4S	A	E	THRIE	D	C	G3	B	G4W	G1
VALUES	1494.28	3105.62	3260.51	3279.02	3293.31	3363.37	3468.50	3628.56	4153.15	4163.05	8394.79
TOTAL COST	G2	A	C	E	G4S	D	THRIE	B	G4W	G1	G3
VALUES	3511.66	5352.88	5810.88	6171.40	6197.99	6330.75	6885.69	6995.53	7255.43	9787.17	10220.94
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1	G3
VALUES	4.58	3.57	3.10	2.58	2.48	2.47	2.31	2.12	2.07	1.68	1.08

C.17

SUMMARY OF RESULTS

CASE 17. 4-LANE FREEWAY

CASE 17

PAVEMENT-TO-GUARDRAIL DISTANCE = 8 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 14 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 9379.85
 AADT = 10000 GUARDRAIL LENGTH = 500 FT OBSTACLE LENGTH = 400 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	1392.38	2017.38	2092.38	2342.38	2842.38	2892.38	2967.38	3092.38	3092.38	3592.38	6592.38
SOCIETAL COST	G2	G4S	E	D	A	THRIE	C	G3	B	G4W	G1
VALUES	1355.34	3036.76	3150.35	3194.44	3205.02	3310.61	3528.95	3620.98	4078.18	4087.23	7868.84
TOTAL COST	G2	A	C	E	G4S	D	THRIE	B	G4W	G1	G3
VALUES	3372.72	5297.39	5871.33	6042.73	6129.14	6161.82	6902.99	6920.56	7179.61	9261.22	10213.36
BENEFIT/COST	G2	A	C	E	D	G4S	B	G4W	THRIE	G1	G3
VALUES	3.98	2.95	2.50	2.15	2.08	2.05	1.87	1.71	1.69	1.09	.87

SUMMARY OF RESULTS

CASE 18. 4-LANE FREEWAY

CASE 18

PAVEMENT-TO-GUARDRAIL DISTANCE = 10 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 16 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 8224.84
 AADT = 10000 GUARDRAIL LENGTH = 500 FT OBSTACLE LENGTH = 400 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0	PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA										
STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	1392.38	2017.38	2092.38	2342.38	2842.38	2892.38	2967.38	3092.38	3092.38	3592.38	6592.38
SOCIETAL COST	G2	G4S	D	E	A	THRIE	G3	C	B	G4W	G1
VALUES	1233.42	2830.90	2921.57	2969.11	3033.73	3140.46	3424.78	3439.66	3883.91	3892.01	7118.28
TOTAL COST	G2	A	C	E	D	G4S	B	THRIE	G4W	G1	G3
VALUES	3250.80	5126.10	5782.04	5861.49	5888.95	5923.28	6726.29	6732.84	6984.39	8510.66	10017.15
BENEFIT/COST	G2	A	C	E	D	G4S	B	THRIE	G4W	G1	G3
VALUES	3.47	2.48	2.04	1.82	1.79	1.74	1.53	1.42	1.40	.79	.73

C.19

CASE 19

CASE 19. 4-LANE FREEWAY

SUMMARY OF RESULTS

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT
 PAVEMENT-TO-OBSTACLE DISTANCE = 18 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 7240.06
 AADT = 10000 GUARDRAIL LENGTH = 500 FT OBSTACLE LENGTH = 400 FT

PREFERRED GUARDRAIL ORDER BY INDICATED CRITERIA												
DEGREE OF CURVE		1	2	3	4	5	6	7	8	9	10	11
0	STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
	VALUES	1392.38	2017.38	2092.38	2342.38	2892.38	2892.38	2967.38	3092.38	3092.38	3592.38	6592.38
	SOCIETAL COST	G2	G4S	D	E	A	THRIE	G3	C	B	G4W	G1
	VALUES	1133.47	2572.85	2620.45	2785.88	2809.38	2879.69	3141.24	3279.02	3641.28	3648.44	6329.96
	TOTAL COST	G2	A	D	C	G4S	E	THRIE	B	G4W	G1	G3
VALUES	3150.85	4901.76	5587.82	5621.40	5665.23	5678.26	6472.07	6483.65	6740.82	7722.34	9733.62	
	BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1	G3
	VALUES	3.03	2.12	1.69	1.56	1.54	1.51	1.27	1.21	1.16	.65	.62

PAVEMENT-TO-GUARDRAIL DISTANCE = 12 FT GUARDRAIL-TO-OBSTACLE DISTANCE = 6 FT

PAVEMENT-TO-OBSTACLE DISTANCE = 18 FT SOCIETAL COST WITH NO GUARDRAIL = \$ 14481.44

AADT = 20000 GUARDRAIL LENGTH = 500 FT OBSTACLE LENGTH = 400 FT

DEGREE OF CURVE	1	2	3	4	5	6	7	8	9	10	11
0 STATE COST	G1	G2	A	C	B	E	D	G4W	G4S	THRIE	G3
VALUES	1392.38	2017.38	2092.38	2342.38	2842.38	2842.38	2467.38	3042.38	3042.38	3542.38	6542.38
SOCIETAL COST	G2	G4S	D	E	A	THRIE	G3	C	B	G4W	G1
VALUES	2262.80	5141.55	5236.75	5567.61	5614.62	5755.24	6278.34	6553.89	7278.41	7292.74	12655.78
TOTAL COST	G2	A	D	G4S	E	C	THRIE	B	G4W	G3	G1
VALUES	4280.18	7707.00	8204.13	8233.93	8459.99	8896.27	9347.62	10120.78	10385.12	12070.72	14048.16
BENEFIT/COST	G2	A	C	D	E	G4S	B	THRIE	G4W	G1	G3
VALUES	6.06	4.24	3.38	3.12	3.08	3.02	2.53	2.43	2.32	1.31	1.24

APPENDIX D

SSCOST PROGRAM LISTING

The listing of the SSCOST program follows. The program consists of a main program and twenty-three subroutines. Flow charts are not presented because it is considered that little can be gained by their use. The FORTRAN statements are arranged in logical groups with the function of each group indicated by comment statements. Also, the variable names have been selected to have mnemonic significance. Hence, the program logic can be followed as easily from the FORTRAN listing as from a flow chart. Brief descriptions of the functions of the main program and various subroutines follow. A dictionary of variable names is provided later in Appendix F.

MAIN Program

The main program maintains overall control of the execution. It first calls in the input data and performs the necessary initializations. Probabilities for the various impact conditions are then computed by calling the PROBAB subroutine, and the number of yearly impacts are calculated. The SEVER subroutines are then called to determine the accident severities, followed by calling TRADEL to compute the travel delay time. Finally, costs are computed, including the CNGRD subroutine to compute societal cost if no guardrail is installed. Program control then transfers back to the beginning of the program for the next set of input data. As shown in Figure 6, as many input data sets can be stacked as desired. Program termination is effected by encountering an end-of-file.

ASEVER, BSEVER, CSEVER, DSEVER, ESEVER, G1SEV, G2SEV, G3SEV, G4SSEV, G4WSEV, and THRIE Subroutines

As established from the BARRIER VII runs, these SEVER subroutines include the 24 accident severities for the category impact conditions (see Table 5 of Volume I. Technical Documentation). If sufficient accident data were obtained, the data cards in these subroutines can be changed to reflect these actual data instead of the extrapolated simulation results.

CNGRD Subroutine

This subroutine computes the estimate of societal cost with no installation of guardrail. As indicated by the comment cards, included are computations of probabilities, number of yearly impacts, accident severities, travel delay, and associated costs.

INJURY Subroutine

The SEVER data statements include maximum 50-ms averages of lateral and longitudinal vehicle accelerations. This subroutine converts these accelerations to injury classifications according to the guardrail severity level indicator (see Figure 9 of Volume I).

OBSTA Subroutine

This subroutine changes the injury classifications when the guardrail deflects past the obstacle. For a fixed obstacle, severities are set at 0.5 injury, 0.5 fatality, and 0.5 vehicle damage when the guardrail deforms more than the guardrail-to-obstacle distance. For embankments, the guardrail-to-obstacle distance is set at 5 feet.

PROBAB Subroutine

This subroutine calculates the combined probabilities of impacts for specified offset distances and category values of vehicle speeds and impact angles (see Figures 5 and 6 and Table 4 of Volume I). The PROBO subroutine is called for the probabilities of the impact angles at the category speeds.

PROBO Subroutine

This subroutine calculates the distribution of category impact angles for a specified vehicle speed, offset distance, and degree of horizontal curvature. The mathematical basis for the subroutine is discussed in Appendix D of Volume I. The subroutine PROBN is called from this subroutine.

PROBN Subroutine

This subroutine calculates the normal distribution probabilities for a specified impact angle.

TRADEL Subroutine

As formulated in Appendix E of Volume I, this subroutine calculates the travel delay for specified values of AADT, highway type, and times to remove the damaged vehicle and repair the damaged guardrail. The subroutines VEL50, VEL60, ACCDT, and REPAIR are called from this subroutine.

ACCDT Subroutine

This subroutine computes the travel delay caused by blockage of the damaged vehicle. Formulation of the problem is discussed in Appendix E of Volume I.

REPAIR Subroutine

As formulated in Appendix E of Volume I, this subroutine calculates the travel delay caused by repair of the damaged guardrail.

VEL60 Subroutine

For a specified volume-to-capacity ratio, this subroutine computes the vehicle operating speed for the 60 mph AHS curve in Figure E.2 of Volume I.

VEL50 Subroutine

For a specified volume-to-capacity ratio, this subroutine computes the vehicle operating speed for the 50 mph AHS curve in Figure E.2 of Volume I.

VELF Subroutine

For a specified volume-to-capacity ratio, this subroutine computes the vehicle operating speed for the Level F curve in Figure E.2 of Volume I.

Operating Characteristics

The CDC-6500 version of the SSCOST program requires a 60k core. For four sets of input data, including the two sets shown in Figure 6, the run required 8.45 seconds of CP time and 28.38 seconds of IO time. For the IBM-370 version, a 360k core was required, and 30.60 seconds of CPU time were used. Costs for the CDC and IBM runs were approximately \$10.75 and \$17.70, respectively.

```

PROGRAM SSCOST(INPUT,OUTPUT,TAPE60=INPUT)
COMPUTES STATE AND SOCIETAL COSTS FOR GUARDRAIL INSTALLATIONS
COMPUTED BY LEE R. CALCOTE FOR SMRI PROJECT 03-4309
DIMENSION TITLE(10),ANG(4),ITYPE(12)
COMMON/CS1/H22(12),H45(12),E22,E45,TOT(8),PR8(4),TNH(12),TOL(12),
ICOST(12),EFP,EFA,CINJ,CFAT,C22,C45,CTD,CNG
COMMON/PRO/V,TL,DEG,P7,PLS,P25,P30,THETA,IPASS,HD,ANGL(2,3),
IP8(2,12),OFL,OFB
COMMON/TRA/AHT,CAB,CRG,SAQ,DVAQ,AADT,IHT,TRV,TRG,IB,TM
COMMON/SEV/W(24),F(24),GD(24),VD(24),DEF(24),OBS
DATA (ITYPE(I), I=1,12)/SHNONE ,SHA ,SH8 ,SHC ,SHD
15HE ,SHG1 ,SHG2 ,SHG3 ,SHG4S ,SHG4W ,SHTHRIE /
CALL IN TITLE
1 READ 100,TITLE
100 FORMAT(10A8)
15 IF(EOF(60))2,3
2 PRINT 99
99 FORMAT(/5X*JOB FINISHED*)
STOP
20 CALL IN HIGHWAY TYPE HT(2,3,4 = 2-LANE, 3-LANE, 4-LANE RURAL ROADS AND
C 5,6,7 = 4-LANE, 6-LANE, 8-LANE FREEWAYS), GUARDRAIL TYPE GT, LENGTH
C OF GUARDRAIL NEED GL IN FEET, AADT, TRAFFIC MIX T22 AND T45,
C HIGHWAY DIVISION HD(0 = UNDIVIDED AND 1 = DIVIDED), AND FHWA REGION
3 READ 101,HT,GT,GL,AADT,T22,T45,HD,FHWA
101 FORMAT(F10.0)
25 CALL IN LEFT AND RIGHT OFFSET DISTANCES OFL AND OFR, DEGREE OF CURVE DEG,
C GUARDRAIL-TO-OBSTACLE DISTANCE OBS, AND OBSTACLE LENGTH OBL
READ 101,OFL,OFR,DEG,OBS,OBL
CALL IN TIMES TO REMOVE DAMAGED VEHICLE AND REPAIR GUARDRAIL
READ 101,TRV,TRG
30 CALL IN INJURY COST CINJ, FATALITY COST CFAT, INSTALLATION COST CI,
C REPAIR COST CRE, MAINTENANCE COST CMA, VEHICLE COSTS C22 AND C45, AND
C TRAVEL DELAY COST CTD
READ 101,CINJ,CFAT,CI,CRE,CMA,C22,C45,CTD
35 CALL IN ESTIMATED SERVICE LIFE SL, CURRENT INTEREST RATE RI, SALVAGE
C VALUE, AND PRINT FLAG (0 FOR COMPLETE PRINT AND 1 FOR PRINT OF COST
C SHEET ONLY)
READ 101,SL,RI,SLV,PRINT
INT=HT*0.01
IGT=GT*0.01
IFHWA=FHWA*0.01
IPRINT=PRINT*0.01
CALL IN ENCROACHMENT RATE
IF(IHT.EQ.2)ER=0.00030
IF(IHT.EQ.3.OR.IHT.EQ.4)ER=0.00019
IF(IHT.GT.4)ER=0.00023
COMPUTE NUMBER OF ENCROACHMENTS
E22=ER*GL*AADT*T22/5280.0
E45=ER*GL*AADT*T45/5280.0
COMMENCE CALL-OUT OF RESULTS
IF(IPRINT.EQ.1) GO TO 300
PRINT 200,TITLE
200 FORMAT(14I,10X,10A8,/,20X*SHEET 1. INPUT INFORMATION*/)
PRINT 201,IHT
201 FORMAT(/15X*HIGHWAY TYPE =*,I3,*, WHERE*/20X*2 = 2-LANE RURAL*/20X
1*3 = 3-LANE RURAL*/20X*4 = 4-LANE RURAL*/20X*5 = 4-LANE FREEWAY*
2/20X*6 = 6-LANE FREEWAY*/20X*7 = 8-LANE FREEWAY*)

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IF(CHD.LT.0.01) PRINT 199
199 FORMAT(/15X*HIGHWAY IS UNDIVIDED*)
IF(CHD.GT.0.01) PRINT 202
202 FORMAT(/15X*HIGHWAY IS DIVIDED*)
PRINT 203,AADT
203 FORMAT(/15X*AADT =*,F7.0,* VEHICLES PER DAY*)
TP22=TP2*100.0
TP45=TP5*100.0
PRINT 204,TP22,TP45
204 FORMAT(/15X*TRAFFIC MIX*/20X*2250-LB VEHICLES =*,F4.0,* PERCENT*
1/20X*4500-LB VEHICLES =*,F4.0,* PERCENT*)
PRINT 205,E22,E45
205 FORMAT(/15X*EXPECTED NUMBER OF ENCROACHMENTS PER YEAR*/20X
1*2250-LB VEHICLES =*,F6.4,/20X*4500-LB VEHICLES =*,F6.4)
PRINT 206
206 FORMAT(/15X*GUARDRAIL SITE CONDITIONS*)
PRINT 207,IGT
207 FORMAT(20X*GUARDRAIL TYPE =*,I3,*, WHERE*/
125X*1 = TYPE A*/25X*2 = TYPE B*/25X*3 = TYPE C*/25X*4 = TYPE D*/
225X*5 = TYPE E*/25X*6 = TYPE G1*/25X*7 = TYPE G2*/25X*8 = TYPE G3*
3/25X*9 = TYPE G4S*/24X*10 = TYPE G4W*/24X*11 = THREE 6EAM*)
PRINT 208,IGL,CBS
208 FORMAT(20X*LENGTH-OF-NEED FOR GUARDRAIL =*,F7.0,* FEET*/20X,
1*GUARDRAIL-TO-OBSTACLE DISTANCE =*,F4.0,* FEET*)
PRINT 209,OFL,OFB,DEG
209 FORMAT(20X*LEFT OFFSET DISTANCE =*,F4.0,* FEET*/20X*RIGHT OFFSET D
1*STANCE =*,F4.0,* FEET*/20X*DEGREE OF CURVE =*,F4.0)
COMPUTE PROBABILITIES FOR THE VARIOUS IMPACT CONDITIONS
300 IPASS=1
DO 4 I=1,2
DO 4 J=1,12
PR(I,J)=0.0
4 CONTINUE
TL=OFL
CALL PRBAB
IPASS=2
TL=OFB
CALL PRBAB
COMPUTE NUMBER OF IMPACTS
DO 5 I=1,12
H22(I)=F22*(PB(1,I)+PB(2,I))
H45(I)=E45*(PR(1,I)+PB(2,I))
5 CONTINUE
IF(IPRINT.EQ.1) GO TO 301
PRINT 210,TITLE
210 FORMAT(1H1,/,10X,10A8,/,/20X*SHEET 2. PROBABILITIES AND EXPECTED NUM
1BER OF IMPACTS*/)
PRINT 211
211 FORMAT(37X,32(1H*))
PRINT 212
212 FORMAT(37X,1H*,30X,1H*)
PRINT 213,OFL,OFB
213 FORMAT(37X,1H*,1X*OFFSET (LEFT) =*,F5.0,* FEET*,1X,1H*/
137X,1H*,1X*OFFSET (RIGHT) =*,F5.0,* FEET*,1X,1H*)
PRINT 214,DEG
214 FORMAT(37X,1H*,1X*DEGREE OF CURVE =*,F5.0,2X,1H*)

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115 PRINT 212
    PRINT 211
    PRINT 215
215 FORMAT(/10X*SPEED*XX*IMPACT ANGLE*9X*PROBABILITY*8X*PROBABILITY*
118X*NO. OF IMPACTS*10X*(MPH)*10X*(DEGREES)*12X*(LEFT)*13X*(RIGHT)
2*10X*2250-LB VEHICLES*4X*4500-LB VEHICLES*///)
    ANG(1)=7.0
    ANG(2)=15.0
    ANG(3)=25.0
    ANG(4)=30.0
    V=30.0
    DO 6 I=1,4
    PRINT 216,V,ANG(I),PB(1,I),PB(2,I),H22(I),H45(I)
216 FORMAT(F14.0,F18.0,F21.5,F19.5,F23.5,F19.5,/)
    6 CONTINUE
    PRINT 217,ANGL(1,1),ANGL(2,1)
217 FORMAT(20X*95 PERCENTILE IMPACT ANGLE =*,F6.2,* DEGREES ON LEFT*/
120X*95 PERCENTILE IMPACT ANGLE =*,F6.2,* DEGREES ON RIGHT*///)
    V=50.0
    DO 7 I=1,4
    J=I+4
    PRINT 218,V,ANG(I),PB(1,J),PB(2,J),H22(J),H45(J)
    7 CONTINUE
    PRINT 217,ANGL(1,2),ANGL(2,2)
    V=70.0
    DO 8 I=1,4
    J=I+8
    PRINT 218,V,ANG(I),PB(1,J),PB(2,J),H22(J),H45(J)
    8 CONTINUE
    PRINT 217,ANGL(1,3),ANGL(2,3)
    COMPUTE YEARLY ACCIDENT SEVERITIES
301 IF(IGT.EQ.1)CALL ASEVER
    IF(IGT.EQ.2)CALL BSEVER
    IF(IGT.EQ.3)CALL CSEVER
    IF(IGT.EQ.4)CALL DSEVER
    IF(IGT.EQ.5)CALL ESEVER
    IF(IGT.EQ.6)CALL G1SEV
    IF(IGT.EQ.7)CALL G2SEV
    IF(IGT.EQ.8)CALL G3SEV
    IF(IGT.EQ.9)CALL G4SEV
    IF(IGT.EQ.10)CALL G4WSEV
    IF(IGT.EQ.11)CALL THRIE
    CALL INJURY
    CALL OBSTA
    DO 9 I=1,12
    J=I+12
    W(I)=W(I)*H22(I)
    F(I)=F(I)*H22(I)
    GD(I)=GD(I)*H22(I)
    VD(I)=VD(I)*H22(I)
    W(J)=W(J)*H45(I)
    F(J)=F(J)*H45(I)
    GD(J)=GD(J)*H45(I)
    VD(J)=VD(J)*H45(I)
    9 CONTINUE
    IF(IPRINT.EQ.1) GO TO 302
    PRINT 219,TITLE

```

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219 FORMAT(1H1,/10X,10A8,/,20X*SHEET 3. YEARLY ACCIDENT SEVERITIES FOR
1 2250-LB VEHICLES*)
PRINT 220
220 FORMAT(//5X*SPEED*3X*IMPACT ANGLE*4X*NO. OF*9X*NO. OF*6X*GUARDRAI
1L*8X*VEHICLE*8X*MAXIMUM DYNAMIC*/5X*(MPH)*5X*(DEGREES)*4X*INJURIES
2*6X*FATALITIES*4X*DAMAGE (FT)*6X*DAMAGE*9X*DEFLECTION (FT)*//)
302 TOT(1)=W(I)
TOT(2)=F(I)
TOT(3)=GD(I)
TOT(4)=VD(I)
TOT(5)=W(I)
TOT(6)=F(I)
TOT(7)=GD(I)
TOT(8)=VD(I)
DO 10 I=2,12
J=I+12
TOT(1)=TOT(1)+W(I)
TOT(2)=TOT(2)+F(I)
TOT(3)=TOT(3)+GD(I)
TOT(4)=TOT(4)+VD(I)
TOT(5)=TOT(5)+W(J)
TOT(6)=TOT(6)+F(J)
TOT(7)=TOT(7)+GD(J)
TOT(8)=TOT(8)+VD(J)
10 CONTINUE
IF(IPRINT.EQ.1) GO TO 303
V=30.0
DO 11 I=1,4
PRINT 221,V,ANG(I),W(I),F(I),GD(I),VD(I),DEF(I)
221 FORMAT(F4.0,F13.0,F15.5,F15.5,F17.2,/)
11 CONTINUE
PRINT 222
222 FORMAT(//)
V=50.0
DO 12 I=1,4
J=I+4
PRINT 221,V,ANG(I),W(J),F(J),GD(J),VD(J),DEF(J)
12 CONTINUE
PRINT 222
V=70.0
DO 13 I=1,4
J=I+8
PRINT 221,V,ANG(I),W(J),F(J),GD(J),VD(J),DEF(J)
13 CONTINUE
PRINT 222
223 FORMAT(//14X*TOTALS*,4F15.5)
PRINT 224,TITLE
224 FORMAT(1H1,/10X,10A8,/,20X*SHEET 4. YEARLY ACCIDENT SEVERITIES FOR
1 4500-LB VEHICLES*)
PRINT 220
V=30.0
DO 14 I=1,4
J=I+12
PRINT 221,V,ANG(I),W(J),F(J),GD(J),VD(J),DEF(J)
14 CONTINUE
PRINT 222

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```

230 V=50.0
    DO 15 I=1,4
      J=I+16
      PRINT 221,V,ANG(I),W(J),F(J),GO(J),VO(J),DEF(J)
15 CONTINUE
      PRINT 222
      V=70.0
      DO 16 I=1,4
        J=I+20
        PRINT 221,V,ANG(I),W(J),F(J),GO(J),VO(J),DEF(J)
16 CONTINUE
      PRINT 222
      PRINT 223,(TOT(I),I=5,8)
      COMPUTE TRAVEL DELAY
      303 CALL TRADEL
      DO 17 I=1,12
        TNH(I)=H22(I)*H45(I)
17 CONTINUE
        PRB(1)=0.32
        PRB(2)=0.22
        PRB(3)=0.18
        PRB(4)=0.14
        IF(IPRINT.EQ.1) GO TO 304
      PRINT 225,TITLE
      225 FORMAT(1H1,/10X,10A8,//20X*SHEET 5. TRAFFIC DELAY*///)
      PRINT 226,TRV,TRG
      226 FORMAT(/5X*ESTIMATED TIME TO REMOVE DAMAGED VEHICLE **F6.1,
        1* HOURS*//5X*ESTIMATED TIME TO REPAIR DAMAGED GUARDRAIL **F6.1,
        2* HOURS*)
      304 SUM=TR*TM
        IF(IPRINT.EQ.1) GO TO 305
      PRINT 227,TR,TM,SUM
      227 FORMAT(/5X*TRAFFIC DFLAY CAUSED BY ACCIDENT.BLOCKAGE **F6.1,
        1* HOURS*//5X*TRAFFIC DELAY CAUSED BY REPAIR CONGESTION **F6.1,
        2* HOURS*//28X*TOTAL TRAFFIC DELAY **F6.1,* HOURS*///)
      PRINT 228
      228 FORMAT(5X*SPEED*3X*IMPACT ANGLE*3X*TOTAL NO. OF 5X*PROBABILITY*3X
        1*TRAFFIC DELAY*/5X*(MPH)*5X*(DEGREES)*2X*EXPECTED IMPACTS*3X
        2*OF BLOCKAGE*2X*(VEHICLE-HOURS)*///)
      305 V=30.0
      DO 18 I=1,4
        TOL(I)=TNH(I)*PRB(I)*SUM
        IF(IPRINT.EQ.1) GO TO 18
      PRINT 229,V,ANG(I),TNH(I),PRB(I),TOL(I)
      229 FORMAT(F9.0,F13.0,F15.5,F15.2,F17.5)
18 CONTINUE
      IF(IPRINT.EQ.0) PRINT 222
      V=50.0
      DO 19 I=1,4
        J=I+4
        TOL(J)=TNH(J)*PRB(J)*SUM
        IF(IPRINT.EQ.1) GO TO 19
      PRINT 229,V,ANG(I),TNH(J),PRB(J),TOL(J)
19 CONTINUE
      IF(IPRINT.EQ.0) PRINT 222
      V=70.0
      DO 20 I=1,4

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```

290 J=I+8
    TDL(J)=TNH(J)*PRB(I)*SUM
    IF(IPRINT.EQ.1) GO TO 20
    PRINT 224,V,ANG(I),TNH(J),PRB(I),TDL(J)
    20 CONTINUE
    IF(IPRINT.EQ.0) PRINT 222
    TOLY=TDL(I)
    DO 21 I=2,12
    TOLY=TOLY+TDL(I)
    21 CONTINUE
    IF(IPRINT.EQ.1) GO TO 306
    PRINT 230,TOLY
    230 FORMAT(4X,TOTAL*,F15.5)
    PRINT 248,SAQ
    248 FORMAT(//5X*HIGHWAY OPERATING SPEED AT THIS AADT =*,F5.1,* MPH*)
    COMPUTE ECONOMIC FACTORS
    306 RATE=RI/100.0
    ERP=1.0/(1.0+RATE)**SL
    EPA=(1.0-ERP)/RATE
    PRINT 231,TITLE
    231 FORMAT(1H1,10X,10A8,10X*SUMMARY*)
    JJ=IGT+1
    PRINT 232,IFHWA,ITYPE(JJ)
    232 FORMAT(10X*YEARLY ACCIDENT COSTS*//10X*FHWA REGION =*,I3,15X,
    1*GUARDRAIL TYPE =*,I1,A5,/)
    SUM=TOI(1)+TOI(5)
    COST(1)=SUM*CINJ
    PRINT 233,SUM,CINJ,COST(1)
    233 FORMAT(10X*NO. OF INJURIES =*,F8.5,* AT*,F6.0,* DOLLARS EACH =*,
    1F26.2)
    SUM=TOI(2)+TOI(6)
    COST(2)=SUM*CFAT
    PRINT 234,SUM,CFAT,COST(2)
    234 FORMAT(10X*NO. OF FATALITIES =*,F8.5,* AT*,F8.0,* DOLLARS EACH =*,
    1,F22.2)
    SUM=TOI(3)+TOI(7)
    COST(3)=SUM*CRE
    PRINT 235,SUM,CRE,COST(3)
    235 FORMAT(10X*BARRIER DAMAGE =*,F8.5,* FEET AT*,F6.2,* DOLLARS PER F
    1T =*,F20.2)
    COST(4)=TOI(4)*C22
    PRINT 236,TOT(4),C22,COST(4)
    236 FORMAT(10X*2250-LB VEHICLE DAMAGE =*,F8.5,* UNITS AT*,F6.0,
    1* DOLLARS EACH =*,F13.2)
    COST(5)=TOI(8)*C45
    PRINT 237,TOT(8),C45,COST(5)
    237 FORMAT(10X*500-LB VEHICLE DAMAGE =*,F8.5,* UNITS AT*,F6.0,
    1* DOLLARS EACH =*,F13.2)
    COST(6)=TOLY*CTD
    PRINT 238,TOLY,CTD,COST(6)
    238 FORMAT(10X*TRAVEL DELAY =*,F8.5,* VEHICLE-HOURS AT*,F6.2,
    1* DOLLARS EACH =*,F15.2)
    CYS=COST(1)
    DO 22 I=2,6
    CYS=CYS+COST(I)
    22 CONTINUE
    PRINT 239,CYS

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345      239 FORMAT(//10X*TOTAL YEARLY SOCIETAL COST =*,F47.2)
          COST(7)=GL*CI
          PRINT 240,GL,CI,COST(7)
      240 FORMAT(//10X*GUARDRAIL INSTALLATION =*,F7.0,* FEET AT*,F6.2,
          1* DOLLARS PER FT =*,F13.2)
          CUST(8)=GL*CMA
          PRINT 241,GL,CMA,COST(8),SLV
      241 FORMAT(//10X*YEARLY MAINTENANCE =*,F7.0,* FEET AT*,F5.2,
          1* DOLLARS PER FT =*,F18.2,//10X*SALVAGE VALUE =*,F60.2)
          PRINT 242,SL,RI,EFP,EFA
      242 FORMAT(//10X*ECONOMIC FACTORS FOR*,F4.0,*-YEAR SERVICE LIFE AT*,
          IF4.0,* PERCENT INTEREST=,F15X*PRESENT VALUE OF FUTURE DOLLAR =*,
          2 F7.4//15X*PRESENT VALUE OF YEARLY ANNUITY =*,F7.4)
          COMPUTE TOTAL COSTS
          COST(8)=COST(8)*EFA
          COST(9)=SLV*EFP
          CG=COST(7)+COST(8)-COST(9)
          COST(10)=(CYS-COST(6))*EFA
          COST(11)=COST(6)*EFA
          CS=COST(10)+COST(11)
          PRINT 250
          PRINT 251
          PRINT 243
      243 FORMAT(8X,1H*,1X*TOTAL GOVERNMENT/STATE PRESENT WORTH COST*,16X,
          11H*,1X*,*TOTAL SOCIETAL PRESENT WORTH COST*,23X,1H*)
          PRINT 251
          PRINT 244,COST(7),COST(10)
      244 FORMAT(8X,1H*,6X*,*INSTALLATION*,F38.2,2X,1H*,6X*,*ACCIDENT DAMAGE*,
          1F35.2,1X,1H*)
          PRINT 251
          PRINT 245,COST(8),COST(11)
      245 FORMAT(8X,1H*,6X*,*MAINTENANCE*,F39.2,2X,1H*,6X*,*TRAFFIC DELAY*,
          1 F37.2,1X,1H*)
          PRINT 251
          PRINT 246,COST(9)
      246 FORMAT(8X,1H*,6X*,*LESS SALVAGE VALUE*,F32.2,2X,1H*,57X,1H*)
          PRINT 251
          PRINT 247,CG,CS
      247 FORMAT(8X,1H*,16X*,*TOTAL*,F35.2,2X,1H*,16X*,*TOTAL*,F35.2,1X,1H*)
          PRINT 251
          PRINT 252
      250 FORMAT(//8X,118(1H*))
      251 FORMAT(8X,1H*,58X,1H*,57X,1H*)
      252 FORMAT(8X,118(1H*))
          COMPUTE ESTIMATED SOCIETAL COST FOR NO GUARDRAIL
          E22=ER*DBL*AADT*T22/5280.0
          E45=ER*DBL*AADT*T45/5280.0
          CALL CNGRD
          COMPUTE TOTAL COSTS AND BENEFIT/COST RATIO
          CTOT=CG+CS
          BEN=CNG-CS
          BC=5EN/CG
          PRINT 251
          PRINT 253,CNG,CTOT
      253 FORMAT(8X,1H*,1X*,*SOCIETAL COST WITH NO GUARDRAIL*,F24.2,2X,1H*,
          11X*,*TOTAL OF STATE AND SOCIETAL COSTS*,F22.2,1X,1H*)
          PRINT 251

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77/05/26. 17.10.22.

FTN 4.2+75021

OPT=1

74/74

PROGRAM SSCOST

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400      PRINT 254,BEN,BC
        254 FORMAT(8X,1H*,1X,*BENEFIT*,F48.2,2X,1H*,1X,*BENEFIT-TO-COST RATIO*
1,F34.2,1X,1H*)
        PRINT 251
        PRINT 252
        GO TO 1
        END
405

```

SUBROUTINE ASEVER

CONSISTS OF SEVERITIES FROM BARRIER VII FOR GUARDRAIL TYPE A

```

COMMON/SEV/M(24),F(24),GD(24),VN(24),DEF(24),OBS
DIMENSION X(24),Y(24),GX(24),VX(24),DEX(24)
DATA (X(I),I=1,24)/0.42,1.22,2.91,4.58,0.84,2.51,5.31,7.04,1.29,
13.22,6.41,7.85,0.37,1.13,2.55,3.31,0.68,1.66,3.15,4.12,1.09,2.12,
23.57,4.40 /
DATA (Y(I),I=1,24)/1.08,2.09,3.36,4.36,2.24,4.29,5.23,5.68,4.14,
17.47,8.72,9.61,0.81,1.76,2.37,2.49,1.85,3.84,3.74,4.37,3.43,4.57,
26.71,5.57 /
DATA (GX(I),I=1,24)/12.5,12.5,12.5,12.5,12.5,12.5,12.5,12.5,12.5,
137.5,37.5,37.5,12.5,12.5,25.0,12.5,12.5,12.5,37.5,37.5,25.0,50.0,
262.5,62.5 /
DATA (VX(I),I=1,24)/0.10,0.15,0.25,0.25,0.15,0.25,0.40,0.40,0.20,
10.30,0.40,0.40,0.10,0.20,0.25,0.30,0.20,0.25,0.30,0.30,0.30,0.35,
20.40,0.40 /
DATA (DEX(I),I=1,24)/0.16,0.39,0.83,1.11,0.35,0.82,1.40,2.17,0.45,
12.05,2.90,3.58,0.22,0.63,1.57,1.41,0.42,2.03,2.78,3.46,0.53,3.08,
25.60,7.47 /
DO 1 I=1,24
  W(I)=X(I)
  F(I)=Y(I)
  GD(I)=GX(I)
  VD(I)=VX(I)
  DEF(I)=DEX(I)
1 CONTINUE
RETURN
END

```



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SUBROUTINE CSEVER
CONSISTS OF SEVERITIES FROM BARRIER VII FOR GUARDRAIL TYPE C
COMMON/SEV/A(24),F(24),GD(24),VD(24),DEF(24),OBS
DIMENSION X(24),Y(24),GX(24),VX(24),DEX(24)
DATA (X(I),I=1,24)/0.43,1.24,2.96,4.77,0.86,2.60,5.83,7.60,1.33,
13.43,7.16,8.79,0.38,1.16,2.80,3.70,0.71,1.54,3.54,4.54,1.07,2.28,
23.43,4.47 /
DATA (Y(I),I=1,24)/1.10,2.12,3.42,4.60,2.22,4.34,5.73,6.13,4.23,
17.49,9.86,9.17,0.83,1.79,2.61,2.81,1.86,4.08,3.88,4.02,3.36,4.74,
25.12,6.37 /
DATA (GX(I),I=1,24)/12.5,12.5,12.5,12.5,12.5,12.5,12.5,12.5,12.5,
125.0,25.0,37.5,12.5,12.5,25.0,25.0,12.5,25.0,37.5,37.5,25.0,50.0,
250.0,62.5 /
DATA (VX(I),I=1,24)/0.10,0.15,0.25,0.25,0.15,0.30,0.35,0.40,0.20,
10.30,0.40,0.40,0.10,0.15,0.20,0.15,0.30,0.35,0.35,0.25,0.35,
20.40,0.45 /
DATA (DEX(I),I=1,24)/0.15,0.38,0.81,1.07,0.34,0.79,1.83,2.07,0.43,
11.92,2.73,3.22,0.21,0.61,1.55,1.89,0.40,1.88,2.58,3.29,0.50,2.43,
25.02,6.44 /
DO 1 I=1,24
  W(I)=X(I)
  F(I)=Y(I)
  GD(I)=GX(I)
  VD(I)=VX(I)
  DEF(I)=DEX(I)
1 CONTINUE
RETURN
END

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77/05/26. 17.10.47.

FTN 4.2+75021

OPT=1

74/74

SUBROUTINE G1SEV

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SUBROUTINE G1SEV
CONSISTS OF SEVERITIES FROM BARRIER VII FOR GUARDRAIL TYPE G1
COMMON/SEV/W(24),F(24),GD(24),VD(24),DEF(24),OBS
DIMENSION X(24),Y(24),GX(24),VX(24),DEX(24)
DATA (X(I),I=1,24)/1.03,1.86,2.51,2.81,1.09,2.32,2.94,3.00,1.16,
12.92,4.51,3.41,0.61,1.08,1.36,1.74,0.77,1.40,1.56,1.60,1.02,1.65,
22.17,1.70 /
DATA (Y(I),I=1,24)/1.96,2.68,3.06,3.12,2.41,3.48,4.15,4.76,2.96,
14.26,5.07,3.80,0.95,1.23,1.42,1.73,1.38,1.42,2.72,2.56,2.09,2.33,
22.44,2.22 /
DATA (GX(I),I=1,24)/0.0,10.0,10.0,10.0,10.0,20.0,30.0,30.0,40.0,40.0,
2130.0,180.0 /
DATA (VX(I),I=1,24)/0.15,0.20,0.20,0.25,0.30,0.30,0.25,0.15,0.20,0.25,
20.35,0.35 /
DATA (DEX(I),I=1,24)/1.85,2.67,3.33,3.58,3.29,4.33,5.71,9.22,4.62,
17.47,10.60,15.91,2.27,3.58,4.76,5.81,4.09,7.03,10.56,14.60,8.61,
29.36,19.30,24.50 /
DO 1 I=1,24
  W(I)=X(I)
  F(I)=Y(I)
  GO(I)=GX(I)
  VD(I)=VX(I)
  DEF(I)=DEX(I)
1 CONTINUE
RETURN
END

```

SUBROUTINE G2SEV

CONSISTS OF SEVERITIES FROM BARRIER VII FOR GUARDRAIL TYPE G2

```

COMMON/SEV/W(24),F(24),GD(24),VD(24),DEF(24),OBS
DIMENSION X(24),Y(24),GX(24),VX(24),DEX(24)
DATA (X(I),I=1,24)/0.34,1.03,2.25,2.64,0.57,1.53,2.88,3.47,1.07,
11.85,3.36,4.45,0.27,0.79,1.32,1.91,0.54,1.03,1.74,2.27,0.83,1.30,
22.21,2.88 /
DATA (Y(I),I=1,24)/0.82,1.68,2.41,2.32,1.95,3.84,4.36,3.86,3.50,
15.13,5.73,5.47,0.66,1.25,1.50,1.74,1.84,2.46,2.89,3.14,2.13,2.72,
23.47,3.60 /
DATA (GX(I),I=1,24)/12.5,12.5,12.5,12.5,12.5,75.0,25.0,37.5,37.5,
150.0,50.0,62.5,12.5,12.5,37.5,37.5,25.0,50.0,62.5,62.5,50.0,87.5,
287.5,87.5 /
DATA (VX(I),I=1,24)/0.10,0.15,0.25,0.30,0.15,0.20,0.15,0.20,0.30,0.15,
10.20,0.30,0.30,0.10,0.15,0.20,0.20,0.15,0.20,0.25,0.20,0.25,
20.25,0.25 /
DATA (DEX(I),I=1,24)/0.26,0.51,1.38,1.78,0.49,1.95,3.28,3.94,0.73,
13.32,5.37,7.25,0.35,0.78,2.49,3.04,0.70,3.18,5.62,7.82,1.36,5.08,
29.50,12.14 /
DO 1 I=1,24
  W(I)=X(I)
  F(I)=Y(I)
  GD(I)=GX(I)
  VD(I)=VX(I)
  DEF(I)=DEX(I)
1 CONTINUE
RETURN
END
```

SUBROUTINE G3SEV

CONSISTS OF SEVERITIES FROM BARRIER VII FOR GUARDRAIL TYPE G3

COMMON/SEV/W(24),F(24),GD(24),VD(24),DEF(24),OBS

DIMENSION X(24),Y(24),GX(24),VX(24),DEX(24)

5 DATA (X(I),I=1,24)/0.41,1.26,3.01,4.48,0.72,2.16,5.11,6.61,1.22,
24.01,5.15 /

DATA (Y(I),I=1,24)/1.17,2.16,3.55,4.46,2.13,4.19,5.97,6.30,4.01,
18.35,7.34,7.98,0.86,1.66,2.85,2.93,1.73,3.43,3.59,3.60,3.27,3.40,
21.34,4.64 /

DATA (GX(I),I=1,24)/24.0,24.0,24.0,24.0,24.0,24.0,24.0,24.0,24.0,24.0,
124.0,48.0,48.0,24.0,24.0,24.0,24.0,24.0,24.0,48.0,48.0,24.0,48.0,
272.0,72.0 /

DATA (VX(I),I=1,24)/0.10,0.15,0.20,0.15,0.15,0.20,0.25,0.25,0.20,
10.30,0.35,0.40,0.10,0.20,0.25,0.25,0.15,0.30,0.35,0.20,0.30,
20.35,0.40 /

DATA (DEX(I),I=1,24)/0.11,0.23,0.43,0.58,0.20,0.43,0.93,1.65,0.31,
10.64,3.27,5.36,0.16,0.34,0.72,1.16,0.31,0.63,3.86,7.10,0.51,2.74,
212.00,16.11 /

DO 1 I=1,24

W(I)=X(I)

F(I)=Y(I)

GD(I)=GX(I)

VD(I)=VX(I)

DEF(I)=DEX(I)

1 CONTINUE

RETURN

END

SUBROUTINE THRIE

CONSISTS OF SEVERITIES FROM BARRIER VII FOR THRIE BEAM GUARDRAIL

COMMON/SEV/W(24),F(24),GD(24),VD(24),DEF(24),OBS

DIMENSION X(24),Y(24),GX(24),VX(24),DEX(24)

5 DATA (X(I),I=1,24)/0.44,1.33,3.00,4.49,0.81,2.34,4.97,6.67,1.36,
13.69,6.81,9.13,0.36,1.02,2.38,3.13,0.63,2.00,3.37,4.67,1.25,2.43,
24.77,6.22 /

10 DATA (Y(I),I=1,24)/1.30,2.33,3.58,4.54,2.31,4.36,5.45,5.89,4.46,
14.80,9.99,9.94,1.08,1.89,2.66,2.61,2.01,3.57,4.52,4.00,3.95,4.95,
25.77,6.96 /

15 DATA (GX(I),I=1,24)/12.5,12.5,12.5,12.5,12.5,12.5,12.5,12.5,12.5,12.5,
125.0,25.0,25.0,12.5,12.5,12.5,12.5,12.5,25.0,25.0,25.0,25.0,37.5,
250.0,50.0 /

DATA (VX(I),I=1,24)/0.05,0.15,0.15,0.15,0.15,0.10,0.20,0.25,0.10,
10.25,0.30,0.35,0.05,0.15,0.20,0.20,0.15,0.20,0.20,0.20,0.25,
20.25,0.30 /

DATA (DEX(I),I=1,24)/0.13,0.23,0.46,0.64,0.21,0.50,1.35,1.68,0.32,
10.88,2.20,2.72,0.18,0.38,0.93,1.43,0.29,0.83,2.10,2.76,0.45,1.87,
24.18,4.93 /

20 DO 1 I=1,24

W(I)=X(I)

F(I)=Y(I)

GD(I)=GX(I)

VD(I)=VX(I)

DEF(I)=DEX(I)

1 CONTINUE

RETURN

END


```

SUBROUTINE CNGRD
  COMPUTES ESTIMATE OF SOCIETAL COST WITH NO GUARDRAIL
  COMMON/CS1/H22(12),H45(12),E22,E45,TOT(5),PR8(4),TNH(12),TDL(12),
  1 CGST(12),EFP,EFA,CINJ,CFAT,C22,C45,CTD,CNG
  5 COMMON/PRQ/V,TL,DEG,P7,P15,P25,P30,THETA,IPASS,HD,ANGL(2,3),
  1 PH(2,12),OFL,OFB
  COMMON/TRA/AHT,CAR,CBC,SAG,DVAG,AADT,IHT,TRV,TRG,TB,TM
  COMMON/SEV/W(24),F(24),GD(24),VD(24),DEF(24),OBS
  COMPUTE PROBABILITIES FOR HITTING OBSTACLE
  10 TL=OFL+OBS
  PLFT=.991812E+02-.701334E+01*TL+.221963E+00*TL**2 -
  1 .365231E-02*TL**3+.302784E-04*TL**4-.999254E-07*TL**5
  IF(TL.GE.90.0.OR.MD.GT.0.01)PLFT=0.0
  TL=OFB+OBS
  15 PRGT=.991812E+02-.701334E+01*TL+.221963E+00*TL**2 -
  1 .365231E-02*TL**3+.302784E-04*TL**4-.999254E-07*TL**5
  IF(TL.GE.90.0)PRGT=0.0
  COMPUTE NUMBER OF IMPACTS
  20 H22(1)=E22*(PLFT+PRGT)/100.0
  H45(1)=E45*(PLFT+PRGT)/100.0
  HTOT=H22(1)+H45(1)
  COMPUTE YEARLY ACCIDENT SEVERITIES
  W(1)=0.50*HTOT
  F(1)=0.50*HTOT
  25 IF(CORS.LI.1.0)F(1)=0.05*HTOT
  VD(1)=0.50*HTOT
  COMPUTE TRAVEL DELAY
  CALL TRADEL
  TDLY=TR*HTOT
  30 COST(1)=W(1)*CINJ
  COST(2)=F(1)*CFAT
  COST(4)=H22(1)*C22
  COST(5)=H45(1)*C45
  COST(6)=TDLY*CTD
  CNO=EFA*(COST(1)+COST(2)+COST(4)+COST(5)+COST(6))
  RETURN
  END

```

```

SUBROUTINE INJURY
  CONVERTS ACCELERATION LEVELS TO INJURY CLASSIFICATIONS
  COMMON/SEV/W(24),F(24),GD(24),VD(24),DEF(24),OBS
  DO 1 I=1,24
    ALL1=SQRT(W(I)**2/25.0+F(I)**2/9.0)
    ALL2=SQRT(W(I)**2/100.0+F(I)**2/49.0)
    IF(ALL1.LE.1.0) GO TO 2
    IF(ALL1.GT.1.0.AND.ALL2.LE.1.0) GO TO 3
    IF(ALL2.GT.1.0) GO TO 4
  2 W(I)=0.0
    F(I)=0.0
    GO TO 1
  3 W(I)=1.0
    F(I)=0.0
    GO TO 1
  4 W(I)=0.0
    F(I)=1.0
  1 CONTINUE
    RETURN
  END

```

```

5      SUBROUTINE OBSTA
      CALCULATES SEVERITIES WHEN GUARDRAIL DEFORMS PAST OBSTACLE
      COMMON/SEV/W(24),F(24),GD(24),VD(24),DEF(24),OBS
      IF(OBS.LT.1.0)OBS=5.0
      DO 1 I=1,24
      IF(DEF(I).LE.OBS) GO TO 1
      W(I)=0.5
      F(I)=0.5
      VD(I)=0.50
      1 CONTINUE
      RETURN
      END
10

```



```

SUBROUTINE PROBAR
  COMPUTES COMBINED PROBABILITIES FOR GIVEN SPEED, OFFSET DISTANCE, AND
  C DEGREE OF CURVE. COMPUTED BY LEE R. CALCULATE FOR PROJECT 03-4309-002
  DIMENSION ANG(4),VEL(4)
  COMMON/PROQ/V,TL,DEG,P7,P15,P25,P30,THETA,IPASS,HD,ANGL(2,3),
  1PR(2,12),OFL,OPR
  COMPUTE PROBABILITY FOR SPECIFIED OFFSET DISTANCE
  3 POFF=.991812E+02-.701334E+01*TL+.221963E+00*TL**2 -
  1 .365231E-02*TL**3+.302784E-04*TL**4-.999254E-07*TL**5
  IF(TL.GE.90)POFF=0.0
  CALL IN SPEED PROBABILITIES AND ANGLES
  PS30=0.304
  PS50=0.466
  PS70=0.230
  ANG(1)=7.0
  ANG(2)=15.0
  ANG(3)=25.0
  ANG(4)=30.0
  V=30.0
  DO 4 I=1,4
  VEL(I)=V
  4 CONTINUE
  CALL PRUBO
  IF(HD.GT.0.01.AND.IPASS.EQ.1) GO TO 5
  PS(IPASS,1) = P7*POFF*PS30/100.0
  PR(IPASS,2) = P15*POFF*PS30/100.0
  PR(IPASS,3) = P25*POFF*PS30/100.0
  PR(IPASS,4) = P30*POFF*PS30/100.0
  5 ANGL(IPASS,1)=THETA
  V=50.0
  DO 6 I=1,4
  VEL(I)=V
  6 CONTINUE
  CALL PRUBO
  IF(HD.GT.0.01.AND.IPASS.EQ.1) GO TO 7
  PS(IPASS,5) = P7*POFF*PS50/100.0
  PR(IPASS,6) = P15*POFF*PS50/100.0
  PR(IPASS,7) = P25*POFF*PS50/100.0
  PR(IPASS,8) = P30*POFF*PS50/100.0
  7 ANGL(IPASS,2)=THETA
  V=70.0
  DO 8 I=1,4
  VEL(I)=V
  8 CONTINUE
  CALL PRUBO
  IF(HD.GT.0.01.AND.IPASS.EQ.1) GO TO 9
  PR(IPASS, 9) = P7*POFF*PS70/100.0
  PR(IPASS,10) = P15*POFF*PS70/100.0
  PR(IPASS,11) = P25*POFF*PS70/100.0
  PR(IPASS,12) = P30*POFF*PS70/100.0
  9 ANGL(IPASS,3)=THETA
  RETURN
END

```

```

SUBROUTINE PROBO
  COMPUTES DISTRIBUTIONS OF IMPACT ANGLES FOR GIVEN SPEED, OFFSET, AND CURVE
  COMMON/PRO/V,TL,DEG,P7,P15,P25,P30,THETA,IPASS,HD,ANGL(2,3),
  IPH(2,12),OFL,OFB
  COMPUTE CONSTANTS
  V=V*88.0/50.0
  A=7.00
  RMIN=V**2/32.2
  IF(TL.GT.RMIN)GO TO 4
  R=SQRT((RMIN-3.00)**2+A**2)
  PHI=ASIN(A/R)
  CALCULATE MAXIMUM ANGLES W/ COEFFICIENT OF FRICTION = 1.0
  IF(DEG.LT.0.0)GO TO 1
  IF(DEG.GT.0.0)GO TO 2
  FACT=(RMIN-TL)/R
  BETA=ACOS(FACT)
  THETA=BETA-PHI
  ALPHA=0.0
  GO TO 3
1  RD=5729.58/DEG
  CR=RD-TL
  A=CR+TL-RMIN
  FACT=(CR**2-A**2-R**2)/(2.0*A*R)
  BETA=ACOS(FACT)
  FACT=R*SIN(BETA)/CR
  ALPHA=ASIN(FACT)
  THETA=BETA-PHI-ALPHA
  GO TO 3
2  RD=5729.58/DEG
  CR=RD+TL
  A=CR-TL-RMIN
  FACT=(A**2-CR**2+R**2)/(2.0*A*R)
  BETA=ACOS(FACT)
  FACT=R*SIN(BETA)/CR
  ALPHA=ASIN(FACT)
  THETA=BETA-PHI+ALPHA
  CHANGE ANGLES TO DEGREES
3  BETA=BETA*57.2957795
  PHI=PHI*57.2957795
  ALPHA=ALPHA*57.2957795
  THETA=THETA*57.2957795
  CALCULATE PROBABILITIES FOR 7, 15, 25, AND 30 DEGREES OF HIT
4  IF(TL.GT.RMIN.OR.THETA.GT.90.0) THETA=90.0
  BAT=THETA/1.4125
  SIG=BAT/4.00
  XP10=(10.0-BAT)/SIG
  XP20=(20.0-BAT)/SIG
  XP30=(30.0-BAT)/SIG
  CALL PROB0N(XP10,P10)
  CALL PROB0N(XP20,P20)
  CALL PROB0N(XP30,P30)
  P7=P10
  P15=P20-P10
  P25=P30-P20
  P30=1.00-P30
  RETURN
END

```

SUBROUTINE PROBN(X,Q)
COMPUTES NORMAL DISTRIBUTION PROBABILITIES FOR IMPACT ANGLES

5 XA=ABS(X)
 FX=EXP(-XA**2/2.0)/2.506628
 T=1.0/(1.0+0.2316419*XA)
 R1=0.31938153
 R2=-0.356563782
 R3=1.781477937
 R4=-1.821255978
 R5=1.33027429
10 Q=FX*(R1+T+R2*T**2+R3*T**3+R4*T**4+R5*T**5)
 IF(X.GT.0.0)Q=1.0-Q
 RETURN
 END

SUBROUTINE TRADL
COMPUTES TRAFFIC DELAY TIME FOR GUARDRAIL ACCIDENT BLOCKAGE AND REPAIR TIME
COMMON/TRA/AHT,CAB,CBC,SAQ,DVAG,AADT,IHT,TRV,IRG,IB,IM

5 GO TO (102,103,104,105,106,107),N-1

COMPUTE VALUES FOR 2-LANE RURAL ROADS
102 AHT=AADT/32.0

CAB=880.0
CBC=220.0
CAP=CAB*32.0
DCAB=AHT/CAB
CALL VEL50(DCAB,SAQ)
CALL ACCDT
CALL REPAIR
RETURN

COMPUTE VALUES FOR 3-LANE RURAL ROADS
103 AHT=AADT/32.0

CAB=1760.0
CBC=880.0
CAP=CAB*32.0
DCAB=AHT/CAB
CALL VEL50(DCAB,SAQ)
CALL ACCDT
CALL REPAIR
RETURN

COMPUTE VALUES FOR 4-LANE RURAL ROADS
104 AHT=AADT/32.0

CAB=3520.0
CBC=1760.0
CAP=CAB*32.0
DCAB=AHT/CAB
CALL VEL50(DCAB,SAQ)
CALL ACCDT
CALL REPAIR
RETURN

COMPUTE VALUES FOR 4-LANE FREEWAYS
105 AHT=AADT/32.0

CAB=3520.0
CBC=1760.0
CAP=CAB*32.0
DCAB=AHT/CAB
CALL VEL60(DCAB,SAQ)
CALL ACCDT
CALL REPAIR
RETURN

COMPUTE VALUES FOR 6-LANE FREEWAYS
106 AHT=AADT/32.0

CAB=5280.0
CBC=3520.0
CAP=CAB*32.0
DCAB=AHT/CAB
CALL VEL60(DCAB,SAQ)
CALL ACCDT
CALL REPAIR
RETURN

COMPUTE VALUES FOR 8-LANE FREEWAYS
107 AHT=AADT/32.0

```

60      CAB=7040.0
        CBC=5280.0
        CAP=CAB*32.0
        DCAB=AH1/CAH
        CALL VEL60(DCAB,SAQ)
        CALL ACCOT
        CALL REPAIR
        RETURN
        END
65

```

```

SUBROUTINE ACCDT
  CALCULATES TIME DELAY CAUSED BY ACCIDENT BLOCKAGE
  COMMON/TRA/AHT,CAB,CBC,SAQ,DVAB,AAAT,INT,TRV,TRG,TS,TM
  N=INT
  5  CALCULATE D/C RATIOS AND CHECK FOR QUEUING
     IFLAG=0
     DCAB=AHT/CAB
     CR=CAB*20.0/SAQ
     CBC=AMIN1(CBC,CR)
     DCBC=AHT/CBC
     IF(DCBC.GT.1.00) GO TO 1
     IFLAG=1
  10  CALCULATE V/C RATIOS
     1  VCAW=DCAB
     VCAR=CBC/CAB
     VCR=1.00
  15  CALCULATE SPEEDS
     IF(N.LE.4) GO TO 2
     CALL VELBU(VCHC,SAC)
     GO TO 3
  20  2 CALL VELSU(VCHC,SAC)
     3 CALL VELF(VCGB,SQH)
  25  CALCULATE RATE OF QUEUING
     RQ=AHT-CBC
  30  CALCULATE DENSITY OF VEHICLES
     DVAB=AHT/SAQ
     DVGB=CBC/SQB
     DVBC=AHT/SBC
  35  CALCULATE CHANGE IN DENSITY
     DD=DVGB-DVAB
     TIME=TRV
     4  QL=TIME*RQ/DD/2.0
     IF(IFLAG.EQ.1)QL=0.0
     IF(IFLAG.EQ.1)SRC=20.0
  40  COMPUTE DELAY TIME
     TB=CR+TIME*(QL*(1.0/SQB-1.0/SAQ)+0.5*(1.0/SBC-1.0/SAQ))
     IF(TB.LT.0.0)TB=0.0
  45  COMPUTE DELAY CAUSED BY GAWKERS FROM OPPOSITE DIRECTION. USE 30-MPH SPEED.
     SR=30.0
     CR=CAR*SR/SAQ
  50  CALCULATE D/C RATIO AND CHECK FOR QUEUING
     IFLAG=0
     DCBC=AHT/CR
     IF(DCBC.GT.1.00) GO TO 5
     IFLAG=1
  55  CALCULATE V/C RATIOS
     5  VCAR=CR/CAB
     VCR=1.00
     CALL VELF(VCAR,SQR)
     RQ=AHT-CR
  60  CALCULATE RATE OF QUEUING
  65  CALCULATE DENSITY AND CHANGE OF DENSITY OF VEHICLES
     DVGB=CR/SQB
     DD=DVGB-DVAB
     3L=TIME*RQ/DD/2.0
     IF(IFLAG.EQ.1)QL=0.0

```



```
60      COMPUTE DELAY TIME
      TM=CR*TIME*(QL*(1.0/308-1.0/SAQ)+0.5*(1.0/SR-1.0/SAQ))
      IF(TM.LT.0.0)TM=0.0
      TB=TS+TM
      RETURN
      END
```

```

SUBROUTINE REPAIR
  CALCULATES TIME DELAY CAUSED BY REPAIR CONGESTION
  COMMON/TRA/HT,CAR,CBC,SAQ,DVAQ,AADT,IHT,TRV,TRG,TB,TM
  CALCULATE SITE CAPACITY. USE 35 MPH FOR SPEED AT REPAIR SITE
5  SR=35.0
  CR=CAR*SR/SAQ
  CALCULATE D/C RATIO AND CHECK FOR QUEUING
  IFLAG=0
  DOBC=HT/CR
  IF(DOBC.GT.1.00) GO TO 1
  IFLAG=1
  CALCULATE V/C RATIOS
  1 VCR=CR/CAR
  VCR=1.00
  CALL VELF(VCR,SQR)
  CALCULATE RATE OF QUEUING
  RO=HT-CR
  CALCULATE DENSITY AND CHANGE OF DENSITY OF VEHICLES
  DVQ=CR/SQR
  DD=DVQB-DVAQ
  COMPUTE QUEUE LENGTH
  TIME=TRG
  2 GL=TIME*RO/DD/2.0
  IF(IFLAG.EQ.1)GL=0.0
  COMPUTE DELAY TIME
  TM=CR*TIME*(GL*(1.0/SQB-1.0/SAQ)+0.5*(1.0/SR-1.0/SAQ))
  IF(TM.LT.0.0)TM=0.0
  RETURN
END

```

```
SUBROUTINE VEL60(X,Y)
C1= 0.601996E+02
C2=-0.444482E+02
C3= 0.203427E+03
C4=-0.668896E+03
C5= 0.879056E+03
C6=-0.400733E+03
Y=C1+C2*X+C3*X**2+C4*X**3+C5*X**4+C6*X**5
RETURN
END
```

5

10

SUBROUTINE VEL50

74/74 OPT=1

SUBROUTINE VEL50(X,Y)
Y=50.0-22.0*X
RETURN
END

FTN 4.2+75021

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PAGE

1

```
SUBROUTINE VELF(X,Y)
C1= 0.427517E-01
C2= 0.177948E+02
C3=-0.112593E+02
C4= 0.555551E+02
C5=-0.775561E+02
C6= 0.434753E+02
Y=C1+C2*X+C3*X**2+C4*X**3+C5*X**4+C6*X**5
RETURN
END
```

5

10

APPENDIX E

COCOST PROGRAM LISTING

The listing of the COCOST program follows. The program consists of a main program and twenty-three subroutines. Since the subroutines are all identical to those used in the SSCOST program, the reader is referred to Appendix D for brief descriptions of their functions. Description of the main program function follows. A dictionary of variable names is provided later in Appendix F.

MAIN Program

The main program maintains overall control of the execution. Note on page 1 of the listing that the various representative costs and input values are preset within the starred lines. These cards can be changed to local values if desired. Changes for these values, or changes between consecutive runs, can also be effected by the KARD flags described in the starred box of page 2.

After calling in the input data and performing the necessary initializations, the program calls the CNGRD, PROBAB, and TRADEL to compute the societal cost with no guardrail, probabilities of impacts for the category vehicle speeds and impact angles, and travel delay. The major difference between the SSCOST and this program then occurs. Rather than a single pass through the SEVER subroutines with a specified guardrail type, this program loops the subroutines to obtain accident severities for each of the eleven guardrail types and saves the results. These results are then used to establish the rankings by state costs, societal costs, total costs, and benefit-to-cost ratios. Finally, the program control is transferred back to the beginning of the program for the next set of input data. As shown in Figure 11, as many input data sets can be stacked as desired. Program termination is effected by encountering an end-of-file.

Operating Characteristics

The CDC-6500 version of the COCOST program requires a 60k core. For three sets of input data, including the two sets shown in Figure 11, the run required 7.88 seconds of CP time and 27.65 seconds of IO time. For the IBM-370 version, a 360k core was required, and 27.93 seconds of CPU time were used. Costs for the CDC and IBM runs were approximately \$10.60 and \$16.00, respectively.

```

PROGRAM COCOST(INPUT,OUTPUT,TAPE60=INPUT)
COMPUTES GUARDRAIL RANK BY SOCIETAL AND TOTAL COSTS AND B/C RATIOS
COMPUTED BY LEE R. CALCOTE FOR SWRI PROJECT 03-4309
DIMENSION TITLE(10),ITYPE(12),CG(11),CS(11),CTOT(11),8C(11),
1JG(11),JS(11),JT(11),JB(11),SG(11),SS(11),ST(11),SB(11),CI(11),
2KARD(5)
COMMON/CST/H22(12),H45(12),E22,E45,TOT(8),PRB(4),TNH(12),TDL(12),
1COST(12),EFP,EFA,CINJ,CFAT,C22,C45,CTD,CNG
COMMON/PRO/V,IL,DEG,P7,P15,P25,P30,THETA,IPASS,HD,ANGL(2,3),
1PB(2,12),OFL,OFB
COMMON/TR/AHT,CAB,CBC,SAQ,DVAQ,AAAT,IHT,TRV,TRG,TB,TM
COMMON/SEV/W(24),F(24),GD(24),VD(24),DEF(24),OBS
DATA (ITYPE(I), I=1,12)/SHNONE ,SHA ,SHB ,SHC ,SHD
15HE ,SHG1 ,SHG2 ,SHG3 ,SHG4 ,SHG5 ,SHG6 ,SHG7 ,SHG8 ,SHG9 ,SHG10 ,SHG11 ,SHG12 /
*****
C*** PRESET INPUT VALUES. CHANGE BY MEANS OF KARD BELOW *****C
CALL IN FRACTION OF 2250-LB VEHICLES T22 AND 4500-LB VEHICLES T45
T22=0.25
T45=0.75
20 CALL IN INSTALLATION COST CI OF THE 11 GUARDRAIL TYPES A THROUGH THRIE
CI(1)=4.50
CI(2)=6.00
CI(3)=5.00
CI(4)=6.25
CI(5)=6.10
CI(6)=3.10
CI(7)=4.35
CI(8)=13.50
CI(9)=6.50
CI(10)=6.50
CI(11)=7.50
30 CMA=0.0
SAL=1.00
CALL IN TIME TO REMOVE DAMAGED VEHICLE TRV AND TIME TO REPAIR GUARDRAIL TRG
TRV=1.00
TRG=10.0
CALL IN COST OF TRAFFIC DELAY CTD
CTD=10.0
40 CALL IN COST OF INJURY CINJ AND COST OF FATALITY CFAT
CINJ=3500.0
CFAT=33100.0
CALL IN COST OF 2250-LB VEHICLE C22 AND 4500-LB VEHICLE C45
C22=3200.0
C45=5300.0
CALL IN SERVICE LIFE SL AND RATE OF INTEREST RI
SL=15.0
RI=8.0
*****
PRB(1)=0.32
PRB(2)=0.22
PRB(3)=0.18
PRB(4)=0.14
IFLAG=1
55 CALL IN TITLE
1 READ 100,TITLE
100 FORMAT(10A8)

```

```

60 IF(EOF(60))2,3
   2 PRINT 99
   99 FORMAT(1H1, /10X*JOB FINISHED*)
      STOP
*****
CALL IN ANY DESIRED CHANGES IN PRESET INPUT VALUES ABOVE.
*
* USE BLANK CARD FOR NO CHANGES IN PRESET INPUT VALUES.
*
* ENTER 1 IN COLUMN 5 FOR CHANGES IN TRAFFIC MIX.
*
* ENTER 1 IN COLUMN 10 FOR CHANGES IN GUARDRAIL COSTS.
*
* ENTER 1 IN COLUMN 15 FOR CHANGES IN TRAVEL DELAY.
*
* ENTER 1 IN COLUMN 20 FOR CHANGES IN INJURY, FATALITY, OR VEHICLE COSTS.
*
* ENTER 1 IN COLUMN 25 FOR CHANGES IN SERVICE LIFE OR INTEREST RATE.
*
*****
3 READ 999,(KARD(I),I=1,5)
999 FORMAT(5I5)
IF(KARD(1).EQ.1) READ 101,T22,T45
IF(KARD(2).EQ.1) READ 101,(CI(I),I=1,11),CMA,SAL
IF(KARD(3).EQ.1) READ 101,TRV,TRG,CTD
IF(KARD(4).EQ.1) READ 101,CINJ,CFAT,C22,C45
IF(KARD(5).EQ.1) READ 101,SL,RI
CALL IN HIGHWAY TYPE HT, HIGHWAY DIVISION HD, LEFT AND RIGHT OFFSET DISTANCES
C
C OFL AND OFR, DEGREE OF CURVE DEG, GUARDRAIL-TO-OBSTACLE DISTANCE OBS,
C AND SHOULDER WIDTH SHWL
   101 FORMAT(8F10.0)
   READ 101,HT,HD,OFL,OFR,DEG,OBS,SHWL
CALL IN GUARDRAIL LENGTH GL, OBSTACLE LENGTH OBL, AADT, AND FINAL DEGREE
C
C OF CURVE DGF
   READ 101,GL,OBL,AADT,DGF
   SLV=GL*SAL
   INT=HT+0.01
   ISHO=SHWL+0.01
   IORS=OBS+0.01
   IADT=AADT+0.01
   IGL=GL+0.01
   IORL=OBL+0.01
CALL IN ENCROACHMENT RATE
IF(IHT.EQ.2)ER=0.00030
IF(IHT.EQ.3.OR.IHT.EQ.4)ER=0.00019
IF(IHT.GT.4)ER=0.00023
COMPUTE ECONOMIC FACTORS
   RATE=R1/100.0
   EFP=1.0/(1.0+RATE)**SL
   EFA=(1.0-EFP)/RATE
COMPUTE ESTIMATED SOCIETAL COST FOR NO GUARDRAIL
   ER2=ER*OBL*AADT*T22/5280.0
   ER5=ER*OBL*AADT*T45/5280.0
   CALL CNGRD
CALL OUT VALUES OF INPUT PARAMETERS
   PRINT 300,TITLE
   300 FORMAT(1H1, /10X*VALUES OF INPUT PARAMETERS*,10X,10A8,/)
   PRINT 301,T22,T45
   301 FORMAT(5X*TRAFFIC MIX*/10X*FRACTION OF 2250-LB VEHICLES*,F12.2,
1/10X*FRACTION OF 4500-LB VEHICLES*,F12.2)
   PRINT 302,ITYPE(2),CI(1)
   302 FORMAT(5X*GUARDRAIL COSTS*/10X*INSTALLATION AND REPAIR*/10X,
1*TYPE*,1X,A5,F30.2,* S/FT*)
      I=2

```



```

115 J=3
      6 PRINT 303, ITYPE(J), CI(I)
      303 FORMAT(15X, A5, F30.2)
      I=I+1
      J=J+1
120 IF (I.LT.12) GO TO 6
      PRINT 304, CMA, SAL
      304 FORMAT(10X, *EARLY MAINTENANCE*, F22.2, * $/FT*, /10X, *SALVAGE VALUE*,
      1 F27.2, * $/FT*/)
      PRINT 305, TRV, TRG, CTD
      305 FORMAT(5X, *TRAVEL DELAY*/10X, *TIME TO REMOVE DAMAGED VEHICLE*, F10.2,
      1 * HOURS*/10X, *TIME TO REPAIR DAMAGED GUARDRAIL*, F8.2, * HOURS*/10X,
      2 *TRAFFIC DELAY COST*, F22.2, * $/HOUR*/)
      PRINT 306, CINJ, CFAT, C45
      306 FORMAT(5X, *INJURY, FATALITY, AND VEHICLE COSTS*/10X,
      1 *COST OF INJURY*, F26.0, * DOLLARS*/10X, *COST OF FATALITY*, F24.0,
      2 /10X, *COST OF 2250-LB VEHICLE*, F17.0, /10X, *COST OF 4500-LB VEHICLE*
      3, F17.0, /)
      PRINT 307, SL, RI
      307 FORMAT(5X, *ECONOMIC FACTORS*/10X, *SERVICE LIFE*, F28.0, * YEARS*,
      1 /10X, *RATE OF INTEREST*, F24.0, * PERCENT*/)
      CALL OUT SUMMARY OF RESULTS
      ITOT=ISHO+IOBS
      PRINT 201, ITLE, ISHO, IOBS, ITOT, CNG, IADI, IGL, IOBL
      201 FORMAT(1H1, //10X, *SUMMARY OF RESULTS*15X, 10A8, //10X, *PAVEMENT-TO-GU
      1 ARDRAIL DISTANCE =*, I3, * FT*, 10X, *GUARDRAIL-TO-OBSTACLE DISTANCE
      2 =*, I3, * FT*, //10X, *PAVEMENT-TO-OBSTACLE DISTANCE =*, I4, * FT, 10X,
      3 *SOCIETAL COST WITH NO GUARDRAIL = $*, F9.2, //10X, *AADT =*, I6, 10X,
      4 *GUARDRAIL LENGTH =*, I5, * FT, 10X, *OBSTACLE LENGTH =*, I5, * FT*//)
      PRINT 202
      202 FORMAT(2X, *DEGREE*4X, *PREFERRED GUARDRAIL ORDER BY INDICATED CRITER
      1 IA*/1X, *OF CURVE*16X, *1*8X, *2*8X, *3*8X, *4*8X, *5*8X, *6*8X, *7*8X, *8*8X, *9*
      2 8X, *10*7X, *11*)
      LINE=12
      35 IDEG=DEG+0.01
      IF (IDEG.LT.0) IDEG=IDEG-1
      COMPUTE NUMBER OF ENCROACHMENTS
      E22=ER*GL*AADT*T22/5280.0
      E45=ER*GL*AADT*T45/5280.0
      COMPUTE PRIORABILITIES FOR THE VARIOUS IMPACT CONDITIONS
      IPASS=1
      DO 4 I=1, 2
      DO 4 J=1, 12
      PR(I, J)=0.0
      * CONTINUE
      TL=OFL
      CALL PR08AB
      IPASS=2
      TL=OFR
      CALL PR08AB
      COMPUTE NUMBER OF IMPACTS
      DO 5 I=1, 12
      H2P(I)=E22*(P6(1, I)+P8(2, I))
      H45(I)=E45*(P8(1, I)+P8(2, I))
      5 CONTINUE
      COMPUTE TRAVEL DELAY
      CALL TRADEL

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```

175      DO 17 I=1,12
          TNH(I)=H22(I)+H*5(I)
17      CONTINUE
          SUM=TB+TM
          DO 18 I=1,4
          TOL(I)=TNH(I)*PR8(I)*SUM
18      CONTINUE
          DO 19 I=1,4
          J=I+4
          TOL(J)=TNH(J)*PR8(I)*SUM
19      CONTINUE
          DO 20 I=1,4
          J=I+8
          TOL(J)=TNH(J)*PR8(I)*SUM
185      CONTINUE
          TOLY=TOL(1)
          DO 21 I=2,12
          TOLY=TOLY+TOL(I)
190      CONTINUE
          COMPUTE YEARLY ACCIDENT SEVERITIES
          DO 11 NN=1,11
          IGT=NN
          IF(IGT.EQ.1)CALL ASEVER
          IF(IGT.EQ.2)CALL BSEVER
          IF(IGT.EQ.3)CALL CSEVER
          IF(IGT.EQ.4)CALL DSEVER
          IF(IGT.EQ.5)CALL ESEVER
          IF(IGT.EQ.6)CALL G1SEV
          IF(IGT.EQ.7)CALL G2SEV
          IF(IGT.EQ.8)CALL G3SEV
          IF(IGT.EQ.9)CALL G4SEV
          IF(IGT.EQ.10)CALL G4WSEV
          IF(IGT.EQ.11)CALL THRIE
          CRE=CI(IGT)
          CALL INJURY
          CALL OBSTA
          DO 4 I=1,12
          J=I+12
          W(I)=W(I)*H22(I)
          F(I)=F(I)*H22(I)
          GD(I)=GD(I)*H22(I)
          VD(I)=VD(I)*H22(I)
          W(J)=W(J)*H*5(I)
          F(J)=F(J)*H*5(I)
          GD(J)=GD(J)*H*5(I)
          VD(J)=VD(J)*H*5(I)
9      CONTINUE
          TOT(1)=W(1)
          TOT(2)=F(1)
          TOT(3)=GD(1)
          TOT(4)=VD(1)
          TOT(5)=W(13)
          TOT(6)=F(13)
          TOT(7)=GD(13)
          TOT(8)=VD(13)
          DO 10 I=2,12
          J=I+12

```

E.5

77/05/26. 17.11.21.

FTN 4.2+75021

PROGRAM COCOST 74/74 OPT=1

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230      TOT(1)=TOT(1)+W(I)
      TOT(2)=TOT(2)+F(I)
      TOT(3)=TOT(3)+GD(I)
      TOT(4)=TOT(4)+VD(I)
      TOT(5)=TOT(5)+A(J)
      TOT(6)=TOT(6)+F(J)
      TOT(7)=TOT(7)+GD(J)
      TOT(8)=TOT(8)+VD(J)
10      CONTINUE
      SUM=TOT(1)+TOT(5)
      COST(1)=SUM*CI*NJ
      SUM=TOT(2)+TOT(6)
      COST(2)=SUM*CFAT
      SUM=TOT(3)+TOT(7)
      COST(3)=SUM*CZE
      COST(4)=TOT(4)*C22
      COST(5)=TOT(8)*C45
      COST(6)=TDLY*CTD
      CYS=COST(1)
      DO 22 I=2,6
      CYS=CYS+COST(I)
22      CONTINUE
      COST(7)=GL*CI(IGT)
      COST(8)=GL*CMA
      COMPUTE TOTAL COSTS
      COST(8)=COST(8)*EFA
      CG(NN)=COST(7)+COST(8)-COST(4)
      COST(10)=(CYS-COST(6))*EFA
      COST(11)=COST(6)*EFA
      CS(NN)=COST(10)+COST(11)
      COMPUTE TOTAL COSTS AND BENEFIT/COST RATIO
      CIOI(NN)=CG(NN)+CS(NN)
      BEN=CNB-CS(NN)
      BC(NN)=BEN/CG(NN)
11      CONTINUE
      COMPUTE ORDER OF INCREASING STATE COSTS
      K=0
13      SMALL=1000000.0
      DO 14 I=1,11
      SMALL=AMINI(SMALL,CG(I))
      IF(SMALL.EQ.CG(I))NN=I
14      CONTINUE
      K=K+1
      SC(K)=CG(NN)
      CG(NN)=1000000.0
      NN=NN+1
      JG(K)=ITYPE(NN)
      IF(K.LT.11) GO TO 13
      COMPUTE ORDER OF INCREASING SOCIETAL COSTS
      K=0
23      SMALL=1000000.0
      DO 24 I=1,11
      SMALL=AMINI(SMALL,CS(I))
      IF(SMALL.EQ.CS(I))NN=I
24      CONTINUE
      K=K+1

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290      SS(K)=CS(NN)
        CS(NN)=10000000.0
        NN=NN+1
        JS(K)=ITYPE(NN)
        IF(K.LT.11) GO TO 23
        COMPUTE ORDER OF INCREASING TOTAL COSTS
        K=0
        25 SMALL=1000000.0
        DO 26 I=1,11
            SMALL=AMINI(SMALL,CTOT(I))
            IF(SMALL.EQ.CTOT(I))NN=I
        26 CONTINUE
        K=K+1
        SI(K)=CTOT(NN)
        CTOT(NN)=10000000.0
        NN=NN+1
        JT(K)=ITYPE(NN)
        IF(K.LT.11) GO TO 25
        COMPUTE ORDER OF DECREASING BENEFIT/COST RATIOS
        K=0
        27 SMALL=-100.0
        DO 28 I=1,11
            SMALL=MAXI(SMALL,BC(I))
            IF(SMALL.EQ.BC(I))NN=I
        28 CONTINUE
        K=K+1
        SB(K)=BC(NN)
        BC(NN)=-1000.0
        NN=NN+1
        J5(K)=ITYPE(NN)
        IF(K.LT.11) GO TO 27
        PRINT 203,DEG,(J6(I),I=1,11)
        PRINT 207,(SG(I),I=1,11)
        PRINT 204,(JS(I),I=1,11)
        PRINT 207,(SS(I),I=1,11)
        PRINT 205,(JT(I),I=1,11)
        PRINT 207,(ST(I),I=1,11)
        PRINT 205,(JH(I),I=1,11)
        PRINT 207,(SB(I),I=1,11)
        203 FORMAT(/,16,2X,'STATE COST',7X,11(A5,4X))
        204 FORMAT(8X,'SOCIAL COST',4X,11(A5,4X))
        205 FORMAT(8X,'TOTAL COST',7X,11(A5,4X))
        206 FORMAT(8X,'BENEFIT/COST',5X,11(A5,4X))
        207 FORMAT(10X,'VALUES',5X,11F9.2)
        DEG=DEG-2.0
        LINE=LINE+9
        IF(LINE.LT.52.OR.DEG.LT.DGF) GO TO 29
        PRINT 201,TITLE,ISHO,IOBS,ITOT,CNG,IADT,IGL,IOBL
        PRINT 202
        LINE=12
        29 IFLAG=IFLAG+1
        IF(DEG.GT.DGF) GO TO 35
        IFLAG=1
        GO TO 1
        END
300
305
310
315
320
325
330
335
340

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SUBROUTINE ASEVER
CONSISTS OF SEVERITIES FROM BARRIER VII FOR GUARDRAIL TYPE A
COMMON/SEV/W(24),F(24),GD(24),VD(24),DEX(24),OBS
DIMENSION X(24),Y(24),GX(24),VX(24),DEX(24)
DATA (X(I),I=1,24)/0.42,1.22,2.91,4.58,0.84,2.51,5.31,7.04,1.29,
13.22,6.41,7.85,0.37,1.13,2.55,3.31,0.68,1.66,3.15,4.12,1.09,2.12,
23.57,4.40 /
DATA (Y(I),I=1,24)/1.08,2.09,3.36,4.36,2.24,4.29,5.23,5.68,4.14,
17.47,8.72,9.61,0.81,1.76,2.37,2.49,1.85,3.84,3.74,4.37,3.43,4.57,
26.71,5.57 /
DATA (GX(I),I=1,24)/12.5,12.5,12.5,12.5,12.5,12.5,12.5,12.5,12.5,
137.5,37.5,37.5,12.5,12.5,25.0,12.5,12.5,37.5,37.5,37.5,25.0,50.0,
262.5,62.5 /
DATA (VX(I),I=1,24)/0.10,0.15,0.25,0.25,0.15,0.25,0.40,0.40,0.20,
10.30,0.40,0.40,0.10,0.20,0.25,0.30,0.20,0.25,0.30,0.30,0.30,0.35,
20.40,0.40 /
DATA (DEX(I),I=1,24)/0.16,0.39,0.83,1.11,0.35,0.82,1.90,2.17,0.45,
12.05,2.90,3.58,0.22,0.63,1.57,1.91,0.42,2.03,2.78,3.96,0.53,3.08,
25.60,7.47 /
DO 1 I=1,24
W(I)=X(I)
F(I)=Y(I)
GD(I)=GX(I)
VD(I)=VX(I)
DEX(I)=DEX(I)
1 CONTINUE
RETURN
END

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SUBROUTINE CSEVER
  CONSISTS OF SEVERITIES FROM BARRIER VII FOR GUARDRAIL TYPE C
  COMMON/SEV/M(24),F(24),GD(24),VD(24),DEF(24),OBS
  DIMENSION X(24),Y(24),GX(24),VX(24),DEX(24)
  DATA (X(I),I=1,24)/0.43,1.24,2.96,4.77,0.86,2.60,5.83,7.60,1.33,
13.43,7.16,8.78,0.38,1.16,2.80,3.70,0.71,1.79,3.54,4.54,1.07,2.28,
23.43,4.97 /
  DATA (Y(I),I=1,24)/1.10,2.12,3.42,4.60,2.22,4.34,5.73,6.13,4.23,
17.49,9.86,9.17,0.83,1.79,2.61,2.81,1.86,4.08,3.88,4.02,3.36,4.74,
25.12,6.37 /
  DATA (GX(I),I=1,24)/12.5,12.5,12.5,12.5,12.5,12.5,12.5,12.5,12.5,
125.0,25.0,37.5,12.5,12.5,25.0,25.0,12.5,25.0,37.5,37.5,25.0,50.0,
250.0,62.5 /
  DATA (VX(I),I=1,24)/0.10,0.15,0.25,0.25,0.15,0.30,0.35,0.40,0.20,
10.30,0.40,0.40,0.10,0.15,0.20,0.20,0.15,0.30,0.35,0.25,0.35,
20.40,0.45 /
  DATA (DEX(I),I=1,24)/0.15,0.38,0.81,1.07,0.34,0.79,1.83,2.07,0.43,
11.82,2.73,3.22,0.21,0.61,1.55,1.89,0.40,1.88,2.58,3.29,0.50,2.93,
25.02,6.99 /
  DO 1 I=1,24
    W(I)=X(I)
    F(I)=Y(I)
    GO(I)=GX(I)
    VD(I)=VX(I)
    DEF(I)=DEX(I)
1  CONTINUE
  RETURN
END

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SUBROUTINE DSEVER
CONSISTS OF SEVERITIES FROM BARRIER VII FOR GUARDRAIL TYPE D
COMMON/SEV/W(24),F(24),GD(24),VD(24),DEF(24),DBS
DIMENSION X(24),Y(24),GX(24),VX(24),DEX(24)
DATA (X(I),I=1,24)/(0.47,1.23,2.79,4.53,1.03,2.84,5.12,6.25,1.95,
14.73,6.04,8.00,0.47,1.28,2.95,3.30,0.98,1.87,3.11,3.70,1.46,2.51,
23.54,4.61 /
DATA (Y(I),I=1,24)/(0.97,1.98,2.90,4.32,2.24,5.19,5.74,5.64,4.59,
15.97,8.17,8.21,0.90,1.73,2.93,2.58,2.17,2.88,4.45,3.66,3.48,4.90,
24.30,4.97 /
DATA (GX(I),I=1,24)/(12.5,12.5,12.5,12.5,12.5,12.5,12.5,12.5,12.5,0,
137.5,37.5,37.5,12.5,12.5,12.5,12.5,12.5,12.5,0,25.0,37.5,37.5,25.0,50.0,
250.0,50.0 /
DATA (VX(I),I=1,24)/(0.15,0.20,0.25,0.20,0.20,0.35,0.30,0.35,0.20,
10.35,0.35,0.40,0.15,0.20,0.25,0.35,0.25,0.35,0.35,0.40,0.35,0.50,
20.40,0.35 /
DATA (DEX(I),I=1,24)/(0.47,0.75,0.89,1.32,0.63,1.25,1.87,3.25,0.81,
13.39,4.34,4.02,0.56,0.91,1.37,2.17,0.84,1.35,3.54,4.66,0.76,2.95,
26.15,8.21 /
DO 1 I=1,24
X(I)=X(I)
Y(I)=Y(I)
GD(I)=GX(I)
VD(I)=VX(I)
DEF(I)=DEX(I)
1 CONTINUE
RETURN
END

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SUBROUTINE GISEV
  CONSISTS OF SEVERITIES FROM BARRIER VII FOR GUARDRAIL TYPE G1
  COMMON/SEV/W(24),F(24),GD(24),VD(24),DEF(24),OBS
  DIMENSION X(24),Y(24),GX(24),VX(24),DEX(24)
  DATA (X(I),I=1,24)/1.03,1.86,2.51,2.81,1.04,2.32,2.44,3.00,1.16,
12.92,4.51,3.41,0.61,1.08,1.36,1.74,0.77,1.40,1.56,1.60,1.02,1.65,
22.17,1.70 /
  DATA (Y(I),I=1,24)/1.46,2.68,3.06,3.12,2.41,3.48,4.15,4.76,2.46,
14.26,5.07,3.80,0.95,1.23,1.42,1.73,1.38,1.92,2.72,2.56,2.09,2.33,
22.44,2.22 /
  DATA (GX(I),I=1,24)/0.0,10.0,10.0,10.0,10.0,10.0,20.0,30.0,40.0,40.0,40.0,40.0,
140.0,70.0,90.0,20.0,20.0,20.0,30.0,40.0,40.0,50.0,100.0,50.0,60.0,
2130.0,180.0 /
  DATA (VX(I),I=1,24)/0.15,0.20,0.20,0.25,0.30,0.30,0.25,0.20,0.15,0.20,0.25,0.25,
10.20,0.20,0.35,0.15,0.20,0.25,0.30,0.30,0.25,0.25,0.20,0.20,
20.35,0.35 /
  DATA (DEX(I),I=1,24)/1.85,2.47,3.33,3.58,3.29,4.33,5.71,9.22,4.62,
17.47,10.60,15.91,2.27,3.58,4.76,5.81,4.09,7.03,10.56,14.60,6.61,
29.36,19.30,24.50 /
  DO 1 I=1,24
    W(I)=X(I)
    F(I)=Y(I)
    GD(I)=GX(I)
    VD(I)=VX(I)
    DEF(I)=DEX(I)
1  CONTINUE
  RETURN
END

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SUBROUTINE G3SEV
CONSISTS OF SEVERITIES FROM BARRIER VII FOR GUARDRAIL TYPE G3
COMMON/SEV/W(24),F(24),GD(24),VD(24),DEF(24),OBS
DIMENSION X(24),Y(24),GX(24),VX(24),DEX(24)
DATA (X(I),I=1,24)/(0.41,1.26,3.01,4.48,0.72,2.16,5.11,6.61,1.22,
13.13,6.45,8.53,0.35,1.04,2.52,3.21,0.62,1.82,3.26,3.44,0.98,2.33,
24.01,5.15 /
DATA (Y(I),I=1,24)/(1.17,2.16,3.55,4.46,2.13,4.19,5.97,6.30,4.01,
18.35,7.34,7.98,0.86,1.66,2.85,2.93,1.73,3.43,3.59,3.60,3.27,3.90,
24.34,4.64 /
DATA (GX(I),I=1,24)/(24.0,24.0,24.0,24.0,24.0,24.0,24.0,24.0,24.0,
124.0,48.0,48.0,24.0,24.0,24.0,24.0,24.0,24.0,48.0,48.0,24.0,48.0,
272.0,72.0 /
DATA (VX(I),I=1,24)/(0.10,0.15,0.20,0.15,0.20,0.15,0.20,0.25,0.25,0.20,
10.30,0.35,0.40,0.10,0.20,0.25,0.25,0.15,0.30,0.35,0.20,0.30,
20.35,0.40 /
DATA (DEX(I),I=1,24)/(0.11,0.23,0.43,0.58,0.20,0.43,0.93,1.65,0.31,
10.64,3.24,5.36,0.16,0.34,0.72,1.16,0.31,0.63,3.86,7.10,0.51,2.74,
212.00,16.11 /
DO 1 I=1,24
W(I)=X(I)
F(I)=Y(I)
GD(I)=GX(I)
VD(I)=VX(I)
DEF(I)=DEX(I)
1 CONTINUE
RETURN
END

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SUBROUTINE THRIE
CONSISTS OF SEVERITIES FROM BARRIER VII FOR THRIE BEAM GUARDRAIL
COMMON/SEV/W(24),F(24),GD(24),VD(24),DEF(24),OBS
DIMENSION X(24),Y(24),GX(24),VX(24),DEX(24)
DATA (X(I),I=1,24)/0.44,1.33,3.00,4.49,0.81,2.34,4.97,6.67,1.36,
13.69,6.81,9.13,0.36,1.02,2.38,3.13,0.68,2.00,3.37,4.67,1.25,2.43,
24.77,6.22 /
DATA (Y(I),I=1,24)/1.30,2.33,3.58,4.54,2.31,4.36,5.45,5.89,4.46,
16.80,9.99,9.94,1.08,1.99,2.66,2.61,2.01,3.57,4.52,4.00,3.95,4.95,
25.77,6.96 /
DATA (GX(I),I=1,24)/12.5,12.5,12.5,12.5,12.5,12.5,12.5,12.5,12.5,
125.0,25.0,25.0,12.5,12.5,12.5,12.5,12.5,25.0,25.0,25.0,25.0,37.5,
250.0,50.0 /
DATA (VX(I),I=1,24)/0.05,0.15,0.15,0.15,0.15,0.10,0.20,0.25,0.10,
10.25,0.30,0.35,0.05,0.15,0.20,0.20,0.15,0.20,0.20,0.20,0.20,0.25,
20.25,0.30 /
DATA (DEX(I),I=1,24)/0.13,0.23,0.46,0.64,0.21,0.50,1.35,1.68,0.32,
10.88,2.20,2.72,0.18,0.38,0.93,1.43,0.29,0.83,2.10,2.76,0.45,1.87,
24.18,4.93 /
DO 1 I=1,24
W(I)=X(I)
F(I)=Y(I)
GD(I)=GX(I)
VD(I)=VX(I)
DEF(I)=DEX(I)
1 CONTINUE
RETURN
END

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SUBROUTINE CNGRD

COMPUTES ESTIMATE OF SOCIETAL COST WITH NO GUARDRAIL

COMMON/CST/H22(12),H45(12),E22,E45,TOT(8),PRB(4),TNH(12),TOL(12),
1COST(12),EFP,EFA,CINJ,CFAT,C22,C45,CTD,CNG

COMMON/PRO/V,TL,DEG,P7,P15,P25,P30,THETA,IPASS,HD,ANGL(2,3),

1PB(2,12),OFL,OFB

COMMON/TRA/AHT,CAB,CBC,SAQ,DVAQ,AADI,IHT,TRV,TRG,TB,IM

COMMON/SEV/*(24),F(24),GD(24),VD(24),DEF(24),OBS

COMPUTE PROBABILITIES FOR HITTING OBSTACLE

TL=OFL+OBS

PLFT=.991812E+02-.701334E+01*TL+.221963E+00*TL**2 -

1-.365231E-02*TL**3+.302784E-04*TL**4-.999254E-07*TL**5

IF(TL.GE.90.0.OR.HD.GT.0.01)PLFT=0.0

TL=OFL+OBS

PRGT=.991812E+02-.701334E+01*TL+.221963E+00*TL**2 -

1-.365231E-02*TL**3+.302784E-04*TL**4-.999254E-07*TL**5

IF(TL.GE.90.0)PRGT=0.0

COMPUTE NUMBER OF IMPACTS

H22(1)=E22*(PLFT+PRGT)/100.0

H45(1)=E45*(PLFT+PRGT)/100.0

HTOT=H22(1)+H45(1)

COMPUTE YEARLY ACCIDENT SEVERITIES

W(1)=0.50*HTOT

F(1)=0.50*HTOT

IF(OBS.LT.1.0)F(1)=0.05*HTOT

VD(1)=0.50*HTOT

COMPUTE TRAVEL DELAY

CALL TRADEL

TOLY=TB*HTOT

COST(1)=W(1)*CINJ

COST(2)=F(1)*CFAT

COST(4)=H22(1)*C22

COST(5)=H45(1)*C45

COST(6)=TOLY*CTD

CNG=EFA*(COST(1)+COST(2)+COST(4)+COST(5)+COST(6))

RETURN

END

```

5      SUBROUTINE INJURY
      CONVERTS ACCELERATION LEVELS TO INJURY CLASSIFICATIONS
      COMMON/SEV/W(24),F(24),GD(24),VD(24),DEF(24),OBS
      DO 1 I=1,24
      ALL1=SQRT(W(I)**2/25.0+F(I)**2/9.0)
      ALL2=SQRT(W(I)**2/100.0+F(I)**2/49.0)
      IF(ALL1.LE.1.0) GO TO 2
      IF(ALL1.GT.1.0.AND.ALL2.LE.1.0) GO TO 3
      IF(ALL2.GT.1.0) GO TO 4
10     2 W(I)=0.0
      F(I)=0.0
      GO TO 1
      3 W(I)=1.0
      F(I)=0.0
      GO TO 1
      15  4 W(I)=0.0
      F(I)=1.0
      1 CONTINUE
      RETURN
      END
20

```

```

SUBROUTINE OBSTA
  CALCULATES SEVERITIES WHEN GUARDRAIL DEFORMS PAST OBSTACLE
  COMMON/SEV/W(24),F(24),GD(24),VD(24),DEF(24),OBS
  IF(OBS.LT.1.0)OBS=5.0
  DO 1 I=1,24
    IF(DEF(I).LE.OBS) GO TO 1
    W(I)=0.5
    F(I)=0.5
    VD(I)=0.50
  1 CONTINUE
  RETURN
  END

```



```

SUBROUTINE PROBAB
  COMPUTES COMBINED PROBABILITIES FOR GIVEN SPEED, OFFSET DISTANCE, AND
  C DEGREE OF CURVE. COMPUTED BY LEE R. CALCOTE FOR PROJECT 03-4304-002

  DIMENSION ANG(4),VEL(4)
  COMMON/PRO/V,TL,DEG,P7,P15,P25,P30,THETA,IPASS,HD,ANGL(2,3),
  1P8(2,12),OFL,OFR
  COMPUTE PROBABILITY FOR SPECIFIED OFFSET DISTANCE
  3 POFF=.991812E+02-.701334E+01*TL+.221963E+00*TL**2 -
  1.365231E-02*TL**3+.302784E-04*TL**4-.999254E-07*TL**5
  IF(TL.GE.90)POFF=0.0
  CALL IN SPEED PROBABILITIES AND ANGLES
  PS30=0.304
  PS50=0.466
  PS70=0.230
  ANG(1)=7.0
  ANG(2)=15.0
  ANG(3)=25.0
  ANG(4)=30.0
  V=30.0
  DO 4 I=1,4
    VEL(I)=V
  4 CONTINUE
  CALL PROBO
  IF(HD.GT.0.01.AND.IPASS.EQ.1) GO TO 5
  P8(IPASS,1)=P7*POFF*PS30/100.0
  P8(IPASS,2)=P15*POFF*PS30/100.0
  P8(IPASS,3)=P25*POFF*PS30/100.0
  P8(IPASS,4)=P30*POFF*PS30/100.0
  5 ANGL(IPASS,1)=THETA
  V=50.0
  DO 6 I=1,4
    VEL(I)=V
  6 CONTINUE
  CALL PROBO
  IF(HD.GT.0.01.AND.IPASS.EQ.1) GO TO 7
  P8(IPASS,5)=P7*POFF*PS50/100.0
  P8(IPASS,6)=P15*POFF*PS50/100.0
  P8(IPASS,7)=P25*POFF*PS50/100.0
  P8(IPASS,8)=P30*POFF*PS50/100.0
  7 ANGL(IPASS,2)=THETA
  V=70.0
  DO 8 I=1,4
    VEL(I)=V
  8 CONTINUE
  CALL PROBO
  IF(HD.GT.0.01.AND.IPASS.EQ.1) GO TO 9
  P8(IPASS,9)=P7*POFF*PS70/100.0
  P8(IPASS,10)=P15*POFF*PS70/100.0
  P8(IPASS,11)=P25*POFF*PS70/100.0
  P8(IPASS,12)=P30*POFF*PS70/100.0
  9 ANGL(IPASS,3)=THETA
  RETURN
END

```

```

SUBROUTINE PROBO
  COMPUTES DISTRIBUTIONS OF IMPACT ANGLES FOR GIVEN SPEED, OFFSET, AND CURVE
  COMMON/PRO/V,TL,DEG,P7,P15,P25,P30,THETA,IPASS,H0,ANGL(2,3),
  IP6(2,12),OFL,OFB
  5  COMPUTE CONSTANTS
      V=V*88.0/60.0
      A=7.00
      RMIN=V**2/32.2
      IF (TL.GT.RMIN) GO TO 4
      R=SQRT((RMIN-3.00)**2+A**2)
      PHI=ASIN(A/R)
      10  CALCULATE MAXIMUM ANGLES W/ COEFFICIENT OF FRICTION = 1.0
          IF (DEG.LI.0.0) GO TO 1
          IF (DEG.GT.0.0) GO TO 2
          FACT=(RMIN-TL)/R
          BETA=ACOS(FACT)
          THETA=BETA-PHI
          ALPHA=0.0
          GO TO 3
          20  1 RD=-5729.58/DEG
              A=CR+TL-RMIN
              FACT=(CR**2-A**2-R**2)/(2.0*A*R)
              BETA=ACOS(FACT)
              FACT=R*SIN(BETA)/CR
              ALPHA=ASIN(FACT)
              THETA=BETA-PHI-ALPHA
              GO TO 3
              30  2 RD=5729.58/DEG
                  CR=RD+TL
                  A=CR-TL+RMIN
                  FACT=(A**2-CR**2+R**2)/(2.0*A*R)
                  BETA=ACOS(FACT)
                  FACT=R*SIN(BETA)/CR
                  ALPHA=ASIN(FACT)
                  THETA=BETA-PHI+ALPHA
                  35  CHANGE ANGLES TO DEGREES
                      3 BETA=BETA*57.2957795
                      PHI=PHI*57.2957795
                      ALPHA=ALPHA*57.2957795
                      THETA=THETA*57.2957795
                      40  CALCULATE PROBABILITIES FOR 7, 15, 25, AND 30 DEGREES OF HIT
                          4 IF (TL.GT.RMIN.OR.THETA.GT.90.0) THETA=90.0
                              BAT=THETA/1.4125
                              SIG=BAT/4.00
                              XP10=(10.0-BAT)/SIG
                              XP20=(20.0-BAT)/SIG
                              XP30=(30.0-BAT)/SIG
                              CALL PROB0N(XP10,P10)
                              CALL PROB0N(XP20,P20)
                              CALL PROB0N(XP30,P30)
                              P7=P10
                              P15=P20-P10
                              P25=P30-P20
                              P30=1.00-P30
                              RETURN
                              END

```

SUBROUTINE PROBN(X,Q)
COMPUTES NORMAL DISTRIBUTION PROBABILITIES FOR IMPACT ANGLES

XA=ABS(X)

FX=EXP(-XA**2/2.0)/2.506628

T=1.0/(1.0+0.2316419*XA)

B1=0.31938153

B2=-0.356563782

B3=1.781477937

B4=-1.821255978

B5=1.330274429

Q=FX*(B1*T+B2*T**2+B3*T**3+B4*T**4+B5*T**5)

IF(X.GT.0.0)Q=1.0-Q

RETURN

END

5

10

SUBROUTINE TRADEL
COMPUTES TRAFFIC DELAY TIME FOR GUARDRAIL ACCIDENT BLOCKAGE AND REPAIR TIME
COMMON/TRA/AHT,CAB,CBC,SAQ,DVAD,AADT,IHT,TRV,TRG,TB,TM
N=IHT

5 GO TO (102,103,104,105,106,107),N-1

COMPUTE VALUES FOR 2-LANE RURAL ROADS

102 AHT=AADT/32.0

CAB=880.0

CBC=220.0

CAP=CAB*32.0

DCAB=AHT/CAB

CALL VEL50(DCAB,SAQ)

CALL ACCDT

CALL REPAIR

RETURN

15 COMPUTE VALUES FOR 3-LANE RURAL ROADS

103 AHT=AADT/32.0

CAB=1760.0

CBC=880.0

CAP=CAB*32.0

DCAB=AHT/CAB

CALL VEL50(DCAB,SAQ)

CALL ACCDT

CALL REPAIR

RETURN

25 COMPUTE VALUES FOR 4-LANE RURAL ROADS

104 AHT=AADT/32.0

CAB=3520.0

CBC=1760.0

CAP=CAB*32.0

DCAB=AHT/CAB

CALL VEL50(DCAB,SAQ)

CALL ACCDT

CALL REPAIR

RETURN

35 COMPUTE VALUES FOR 4-LANE FREEWAYS

105 AHT=AADT/32.0

CAB=3520.0

CBC=1760.0

CAP=CAB*32.0

DCAB=AHT/CAB

CALL VEL60(DCAB,SAQ)

CALL ACCDT

CALL REPAIR

RETURN

45 COMPUTE VALUES FOR 6-LANE FREEWAYS

106 AHT=AADT/32.0

CAB=5280.0

CBC=3520.0

CAP=CAB*32.0

DCAB=AHT/CAB

CALL VEL60(DCAB,SAQ)

CALL ACCDT

CALL REPAIR

RETURN

55 COMPUTE VALUES FOR 8-LANE FREEWAYS

107 AHT=AADT/32.0

SUBROUTINE TRADEL 74/74 OPT=1

FTN 4.2+75021

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CAB=7040.0
CRC=5280.0
CAP=CAB*32.0
DCAB=ANT/CAR
CALL VEL60(DCAB,SAQ)
CALL ACCOT
CALL REPAIR
RETURN
END

60

65

```

SUBROUTINE ACCDT
  CALCULATES TIME DELAY CAUSED BY ACCIDENT BLOCKAGE
  COMMON/TRA/AHT,CAB,CBC,SAQ,DVAQ,AADT,INT,TRV,TRG,TB,TM
  N=INT
  5  CALCULATE D/C RATIOS AND CHECK FOR QUEUING
     IFLAG=0
     DCAB=AHT/CAB
     CR=CAB*20.0/SAQ
     CBC=AMINI(CBC,CR)
     DCRC=AHT/CBC
     IF(DCRC.GT.1.00) GO TO 1
     IFLAG=1
  10  CALCULATE V/C RATIOS
     1  VCAQ=DCAB
     VCR=CBC/CAB
     VCRC=1.00
  15  CALCULATE SPEEDS
     IF(N.LE.4) GO TO 2
     CALL VELB(VCRC,SBC)
     GO TO 3
     2  CALL VELB(VCRC,SBC)
     3  CALL VELF(VCRB,SQB)
  20  CALCULATE RATE OF QUEUING
     RQ=AHT-CBC
  25  CALCULATE DENSITY OF VEHICLES
     DVAQ=AHT/SAQ
     DVCR=CBC/SQB
     DVSC=AHT/SBC
  30  CALCULATE CHANGE IN DENSITY
     DD=DVQB-DVAQ
     TIME=TRV
     4  QL=TIME*RQ/DD/2.0
     IF(IFLAG.EQ.1) QL=0.0
     IF(IFLAG.EQ.1) SBC=20.0
  35  COMPUTE DELAY TIME
     TB=CBC*TIME*(QL*(1.0/SAB-1.0/SAQ)+0.5*(1.0/SBC-1.0/SAQ))
     IF(TB.LT.0.0) TB=0.0
  40  COMPUTE DELAY CAUSED BY GAWKERS FROM OPPOSITE DIRECTION. USE 30-MPH SPEED.
     SP=30.0
     CR=CAB*SR/SAQ
  45  CALCULATE D/C RATIO AND CHECK FOR QUEUING
     IFLAG=0
     DCRC=AHT/CR
     IF(DCRC.GT.1.00) GO TO 5
     IFLAG=1
  50  CALCULATE V/C RATIOS
     5  VCR=CR/CAB
     VCR=1.00
     CALL VELF(VCRB,SQB)
  55  CALCULATE RATE OF QUEUING
     RQ=AHT-CR
  60  CALCULATE DENSITY AND CHANGE OF DENSITY OF VEHICLES
     DVQB=CR/SQB
     DD=DVQB-DVAQ
  65  COMPUTE QUEUE LENGTH
     QL=TIME*RQ/DD/2.0
     IF(IFLAG.EQ.1) QL=0.0

```



```

        COMPUTE DELAY TIME
        TM=CR*TIME*(GL*(1.0/SQB-1.0/SAQ))+0.5*(1.0/SR-1.0/SAQ))
        IF (IM.LT.0.0) TM=0.0
        TB=TS+TM
        RETURN
        END
    
```

SUBROUTINE REPAIR

CALCULATES TIME DELAY CAUSED BY REPAIR CONGESTION

COMMON/TRA/AHT,CAB,CBC,SAQ,DVAQ,AADT,IHT,TRV,TRG,TB,TM

CALCULATE SITE CAPACITY. USE 35 MPH FOR SPEED AT REPAIR SITE

5 SH=35.0

CR=CAB*SR/SAQ

CALCULATE D/C RATIO AND CHECK FOR QUEUING

IFLAG=0

DCRC=AHT/CR

IF(DCRC.GT.1.00) GO TO 1

IFLAG=1

CALCULATE V/C RATIOS

1 VCR=CR/CAB

VCR=1.00

CALL VLF(VCR,SQB)

CALCULATE RATE OF QUEUING

RQ=AHT-CR

CALCULATE DENSITY AND CHANGE OF DENSITY OF VEHICLES

DVQB=CR/SQB

DD=DVQB-DVAQ

COMPUTE QUEUE LENGTH

TIME=TRG

2 QL=TIME*RRQ/DD/2.0

IF(IFLAG.EQ.1)QL=0.0

COMPUTE DELAY TIME

TM=CR*TIME*(QL*(1.0/SQB-1.0/SAQ)+0.5*(1.0/SR-1.0/SAQ))

IF(TM.LT.0.0)TM=0.0

RETURN

END

77/05/26. 17.12.14.

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74/74 OPT=1

SUBROUTINE VEL60

```
SUBROUTINE VEL60(X,Y)
C1= 0.601996E+02
C2=-0.444482E+02
C3= 0.203427E+03
C4=-0.668896E+03
C5= 0.879056E+03
C6=-0.400733E+03
Y=C1+C2*X+C3*X**2+C4*X**3+C5*X**4+C6*X**5
RETURN
END
```

5

10

SUBROUTINE VEL50(X,Y)
Y=50.0-22.0*X
RETURN
END

SUBROUTINE VELF

74/74

OPT=1

FTN 4.2+75021

77/05/26. 17.12.16.

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SUBROUTINE VELF(X,Y)

C1= 0.427517E+01

C2= 0.177498E+02

C3=-0.112593E+02

C4= 0.555551E+02

C5=-0.775561E+02

C6= 0.434753E+02

Y=C1+C2*X+C3*X**2+C4*X**3+C5*X**4+C6*X**5

RETURN

END

5

10

APPENDIX F

DICTIONARY OF VARIABLE NAMES

This appendix lists the major variables in the SSCOST and COCOST programs and explains their meaning.

Input Variables (arranged alphabetically)

Variable Name	Quantity Represented
AADT	Annual average daily traffic
C22	Cost of a 2250-lb vehicle
C45	Cost of a 4500-lb vehicle
CFAT	Cost of a fatality in dollars
CI	Cost of guardrail installation in dollars per ft
CINJ	Cost of an injury in dollars
CMA	Yearly cost of guardrail normal maintenance in dollars per ft
CRE	Cost of guardrail repair in dollars per ft
CTD	Cost of travel delay in dollars per hour per vehicle
DEG	Degree of horizontal curve. Used for initial degree of curve with multiple runs with varying degrees of curve
DGF	Final degree of curve for multiple runs with varying degrees of curve. DGF = DEG for single runs
FHWA	FHWA region
GL	Guardrail length of need in ft
GT	Guardrail type
HD	Highway division
HT	Highway type
KARD(5)	Flags for changes in input values
OBL	Obstacle exposure length in ft

Variable Name	Quantity Represented
OBS	Guardrail-to-obstacle distance in ft
OFL	Left offset distance in ft
OFR	Right offset distance in ft
PRINT	Print flag
RI	Current interest rate in percent
SAL	Unit salvage value for guardrail in dollars per ft
SHOL	Shoulder width (distance from pavement edge to guardrail) in ft
SL	Guardrail service life in years
SLV	Total salvage value of guardrail in dollars
T22	Fraction of traffic for 2250-lb vehicles
T45	Fraction of traffic for 4500-lb vehicles
TRG	Time to repair damaged guardrail in hours
TRV	Time to remove damaged vehicle in hours

DIMENSION Statements (arranged alphabetically)

ANG(4)	Category angles 7°, 15°, 25°, 30°
BC(11)	Benefit/cost ratios for guardrail types (destroyed in ranking process)
CG(11)	State costs for guardrail types (destroyed in ranking process)
CI(11)	Guardrail installation costs in dollars per ft
CS(11)	Societal costs for guardrail types (destroyed in ranking process)
CTOT(11)	Total costs for guardrail types (destroyed in ranking process)
ITYPE(12)	Indexes for guardrail types in DATA statement
JB(11)	Indexes for guardrail types as ranked by benefit/cost ratios
JG(11)	Indexes for guardrail types as ranked by state costs
JS(11)	Indexes for guardrail types as ranked by societal costs

Variable Name	Quantity Represented
JT(11)	Indexes for guardrail types as ranked by total costs
KARD(5)	Flags for changes in input values
SB(11)	Benefit/cost ratios for guardrail types (saved for printout)
SG(11)	State costs for guardrail types (saved for printout)
SS(11)	Societal costs for guardrail types (saved for printout)
ST(11)	Total costs for guardrail types (saved for printout)
TITLE(10)	Title

Common Blocks CST (arranged as listed in programs)

H22(12)	Number of 2250-lb vehicle hits for each of 12 impact conditions
H45(12)	Number of 4500-lb vehicle hits for each of 12 impact conditions
E22	Number of encroachments for 2250-lb vehicles
E45	Number of encroachments for 4500-lb vehicles
TOT(8)	Totals of injuries, fatalities, guardrail damage, and vehicle damage for 2250-lb and 4500-lb vehicles
PRB(4)	Probabilities for accident blocking the highway (see Table E.1 of Volume I)
TNH(12)	Total number of hits for each of 12 impact conditions
TDL(12)	Total traffic delay for each of 12 impact conditions
COST(12)	Costs for (1) injuries, (2) fatalities, (3) guardrail repair, (4) 2250-lb vehicle damage, (5) 4500-lb vehicle damage, (6) traffic delay, (7) guardrail installation, (8) guardrail maintenance, (9) salvage value, (10) total accident damage, (11) present worth traffic delay, (12) unused
EFP, EFA	Economic factors for present values of (1) \$1 at compound interest and (2) annuity of \$1
CINJ, CFAT, C22, C45, CTD, CNG	Costs for injury, fatality, 2250-lb vehicles, 4500-lb vehicles, travel delay, and societal cost for no guardrail

Common Blocks PRO (arranged as listed in programs)

Variable Name	Quantity Represented
V	Velocity in mph
TL	Total offset distance in ft
DEG	Degree of horizontal curve
P7, P15, P25, P30	Probabilities of 7°, 15°, 25°, and 30° impacts
THETA	95 percentile impact angle (see Appendix D of Volume I)
IPASS	Pass number for probability calculation (1 = left offset, 2 = right offset)
HD	Highway division (0 = undivided, 1 = divided)
ANGL(2,3)	95 percentile impact angles for (left, right) at (30, 50, and 70 mph) speeds
PB(2,12)	Probabilities of hits for (left, right) for each of 12 impact conditions
OFL	Offset distance on left
OFR	Offset distance on right

Common Blocks TRA (arranged as listed in programs)

AHT	Average hourly traffic
CAB	Capacity in Section ab (see Figure E.1 of Volume I)
CBC	Capacity in Section bc (see Figure E.1 of Volume I)
SAQ	Operating speed in Section aq (see Figure E.1 of Volume I)
DVAQ	Vehicle density in Section aq
AADT	Annual average daily traffic
IHT	Highway type
TRV	Time to remove damaged vehicle
TRG	Time to repair damaged guardrail
TB	Traffic delay caused by accident blockage

<u>Variable Name</u>	<u>Quantity Represented</u>
TM	Traffic delay caused by guardrail repair congestion
Common Blocks SEV (arranged as listed in programs)	
W(24)	Number of injuries for each of 24 impact conditions
F(24)	Number of fatalities for each of 24 impact conditions
GD(24)	Guardrail damage for each of 24 impact conditions
VD(24)	Vehicle damage for each of 24 impact conditions
DEF(24)	Maximum dynamic deflection of guardrail for each 24 impact conditions
OBS	Guardrail-to-obstacle distance in ft

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FEDERALLY COORDINATED PROGRAM OF HIGHWAY RESEARCH AND DEVELOPMENT (FCP)

The Offices of Research and Development of the Federal Highway Administration are responsible for a broad program of research with resources including its own staff, contract programs, and a Federal-Aid program which is conducted by or through the State highway departments and which also finances the National Cooperative Highway Research Program managed by the Transportation Research Board. The Federally Coordinated Program of Highway Research and Development (FCP) is a carefully selected group of projects aimed at urgent, national problems, which concentrates these resources on these problems to obtain timely solutions. Virtually all of the available funds and staff resources are a part of the FCP, together with as much of the Federal-aid research funds of the States and the NCHRP resources as the States agree to devote to these projects.*

FCP Category Descriptions

1. Improved Highway Design and Operation for Safety

Safety R&D addresses problems connected with the responsibilities of the Federal Highway Administration under the Highway Safety Act and includes investigation of appropriate design standards, roadside hardware, signing, and physical and scientific data for the formulation of improved safety regulations.

2. Reduction of Traffic Congestion and Improved Operational Efficiency

Traffic R&D is concerned with increasing the operational efficiency of existing highways by advancing technology, by improving designs for existing as well as new facilities, and by keeping the demand-capacity relationship in better balance through traffic management techniques such as bus and carpool preferential treatment, motorist information, and rerouting of traffic.

3. Environmental Considerations in Highway Design, Location, Construction, and Operation

Environmental R&D is directed toward identifying and evaluating highway elements which affect the quality of the human environment. The ultimate goals are reduction of adverse highway and traffic impacts, and protection and enhancement of the environment.

4. Improved Materials Utilization and Durability

Materials R&D is concerned with expanding the knowledge of materials properties and technology to fully utilize available naturally occurring materials, to develop extender or substitute materials for materials in short supply, and to devise procedures for converting industrial and other wastes into useful highway products. These activities are all directed toward the common goals of lowering the cost of highway construction and extending the period of maintenance-free operation.

5. Improved Design to Reduce Costs, Extend Life Expectancy, and Insure Structural Safety

Structural R&D is concerned with furthering the latest technological advances in structural designs, fabrication processes, and construction techniques, to provide safe, efficient highways at reasonable cost.

6. Prototype Development and Implementation of Research

This category is concerned with developing and transferring research and technology into practice, or, as it has been commonly identified, "technology transfer."

7. Improved Technology for Highway Maintenance

Maintenance R&D objectives include the development and application of new technology to improve management, to augment the utilization of resources, and to increase operational efficiency and safety in the maintenance of highway facilities.

* The complete 7-volume official statement of the FCP is available from the National Technical Information Service (NTIS), Springfield, Virginia 22161 (Order No. PB 242057, price \$45 postpaid). Single copies of the introductory volume are obtainable without charge from Program Analysis (HRD-2), Offices of Research and Development, Federal Highway Administration, Washington, D.C. 20590.

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